Minutes of the 1998 Annual RVOC Meeting
University of Hawaii
Honolulu, Hawaii

Wednesday, 4 November 1998
Hawaiian Regent Hotel

The meeting was called to order by RVOC Chair, Paul Ljunggren, Marine Superintendent of Lamont-Doherty Earth Observatory.

WELCOMING REMARKS

Bill Coste, Marine Superintendent, University of Hawaii welcomed the RVOC to Honolulu and introduced Barry Raleigh, Dean of the School of Ocean and Earth Sciences and Technology, University of Hawaii.

Dr. Raleigh gave a brief overview of the School of Ocean and Earth Science and Technology and the impact that the recent award of a NSF Research Center grant would have on the institution. This award is one of five given throughout the country this year and will be used to fund research on growing micro algae for commercial use. The award is given in conjunction with the University of California, Berkley.

The part played by University of Hawaii faculty in this year's election was discussed and the affect their involvement may have on future issues involving the University was mentioned. Dr. Raleigh closed with a brief update of the directed funding for the new mid Pacific SWATH.

AGENDA

The meeting followed the agenda outlined in ***Appendix I***. Registered attendees are listed in ***Appendix II***.

OLD BUSINESS

Minutes of the 1997 Meeting - A motion was made, seconded and passed to accept the minutes of the 1997 meeting.

Medical Standards and Job Descriptions - Fred Jones reported on the findings of the Medical Standards Review Committee. A package including the Medical Standards NVIC was submitted to the Oregon State Legal Department and Dennis Nixon. The consensus was that it would be difficult to enforce standards beyond those required by the Coast Guard. It was pointed out that programs operating in remote or harsh environments, like

the Antarctic, could adopt their own standards but it would be difficult to enforce special standards for mariners on other UNOLS vessels. All scientists working on NSF programs in the Antarctic must meet medical standards established by OPP.

A number of job descriptions are available through Lamont-Doherty Earth Observatory and University of Oregon for those individuals wanting to develop documents for their institutions.

Primer for Small Research Vessels - Dave Powell, group leader for this effort, reported that three sections have not been submitted. As soon as these sections are received the primer will be complete. Dennis Nixon, Dan Schwartz, Steve Carignan and Blake Powell volunteered to serve on the review panel for the primer.

NEW BUSINESS

STCW - An overview of the status of research vessels in general and uninspected research vessels in particular with respect to U.S. Coast Guard requirements for manning and the enforcement of STCW regulations was presented by Steve Rabalais, ***Appendix III***. Discussion followed concerning Coast Guard regulations and their applications to uninspected research vessels. Further action was deferred to the Round Table Discussion.

COMMITTEE AND LIAISON REPORTS

UNOLS - Dr. Robert Knox, UNOLS Chair, reported that these are interesting times for UNOLS and the academic fleet. Although attempts to create a National Ocean Commission were not successful this year, it was an indication of the rising interest in the oceans and emphasized the need for the U.S. to get involved in ocean policy in the broad sense not just ocean science and commerce.

Last week was the 50th anniversary of the NSF Ocean Science Division. The event was very well attended, and did a good job of demonstrating the accomplishments of NSF and ONR in the field of ocean sciences. The NSF budget increased this year and the account for Navy Ocean Studies has stabilized after many years of instability. All of these developments should be viewed with optimism, but the reality is still that the UNOLS fleet is underutilized. Our new partnership with NAVO has reduced the deficit in ship days, but in the long haul may not be the final solution to the problem of under utilization of the fleet.

A number of new ships are coming into the academic fleet from a number of sources. The impact of these new vessels is as yet to be determined. The challenge will be to integrate these new vessels into the fleet and keep the fleet working as a whole at its maximum capacity.

Jack Bash followed with updates on other UNOLS activities:

- The partnership with NOAA has been growing.
- UNOLS will be conducting science systems testing for HEALY which is very important to UNOLS because it will set the ship off on the right track and cement ties between the Coast Guard and UNOLS.
- The JMS contract for the inspection of the UNOLS fleet was a one-year contract extendible for five years. UNOLS has been told by the NSF to terminate the contract after one year because of a technical problem of no relation to JMS. The contract will terminate at the end of April and a new RFP and contract will be let by NSF.
- The UNOLS Office contract will end on 30 April 2000 and a RFP is out for candidates for the new office. Letters of intent are due on 15 November. In six-eight months a new UNOLS Office will be selected.

Safety Committee - Tom Smith reported that the Safety Video is finished and copies have been sent out. The video is intended to augment the safety training manual and should be used to alert scientists to the dangers of going to sea and encourage them to read the training manual.

The Research Vessel Safety Standards (RVSS) are out for review by the Safety Committee and will be out for review by the RVOC as a whole by the end of November. Issues like STCW have delayed the process and some of the questions surrounding manning requirements on unlicensed vessels are still unresolved. The Committee will attempt to resolve the discrepancies in the regulations next year.

Ship Scheduling Committee (SSC) - Mike Prince, Chair, gave an overview of the Scheduling Committee's activity over the past year. Because so many issues that affect the scheduling process are undecided in June the Committee will adopt a new process for addressing the fleet schedule next year. A letter of intent will be submitted by all operators in April or early May and will take the place of the June scheduling meeting. This letter will identify the science projects requesting time on each vessel and will not attempt to present a full schedule with firm dates, transit times and port calls. After funding decisions are made in June, it is anticipated that enough information will be available to begin formulating real schedules. A full scheduling meeting for all schedulers will be held in July. A schedule review meeting will be held in September and will involve those operators who have unresolved scheduling problems on their vessels. Joe Ustach and Mike will develop a format for the letter of intent and distribute it to the schedulers early next year.

Some major unanswered questions still surround the GLOBEC program for 1999 and this is affecting the schedule of a number of UNOLS vessels. NAVO funding questions appear to be resolved and NAVO cruises will go as planned in 1999. The future of NAVO funding for the fleet is not clear.

KNORR will be layed up next year. A number of large ships will have substantial periods at the dock.

Littoral Warfare Advance Deployment (LWAD) cruises scheduled on UNOLS vessels will be working in conjunction with regular Navy assets in 1999. These cruises are fixed in time and UNOLS operators will have to fit these cruises into their schedules.

Research Vessel Technical Enhancement Committee (RVTEC) - Dan Schwartz attended the RVTEC meeting at SIO this year and reviewed the highlights of their meeting. This year RVTEC was combined with INMARTECH. Presentations were given on the current state of the art and future technologies including the deployment of large over the side packages like 30m cores. The RVTEC's involvement with INMARTEC will probably continue and it was recommended that RVOC attempt to coordinate more of our activities with these two groups. It was pointed out that the trend toward more reliance on R/V technical groups and less involvement from individual P.I. technicians will create greater demand on existing R/V tech pools and provide a larger market for these services at our institutions.

Fleet Improvement Committee (FIC) - Joe Coburn, RVOC's representative to FIC and AICC reported on the activities of these two committees. FIC was rather inactive in 1998. The committee has been working on Science Mission Requirements for the East Coast intermediate vessel. Some consideration is being given to revamping FIC and Larry Atkinson is working on this issue. Bob Knox expanded on the history of FIC and how they should provide oversight in strategic planning for new platforms. This oversight is provided through the Fleet Improvement Plan.

Arctic Icebreaker Coordinating Committee (AICC) - The AICC has been working with the Coast Guard in their efforts to develop science capabilities on the Icebreaker HEALY and have been coordinating science of opportunity cruises on vessels working in Polar Regions.

AGENCY REPORTS

National Science Foundation (NSF) - Dolly Dieter reported that Dick West has resigned and his duties have been passed on to Dolly and Sandy Shor. The 1999 NSF budget will increase by 5%, but it is unclear how much of that increase will find its way into ship operations. All indications are that the bulk of this increase will go into science. The administration at NSF considers this increase to be a single year phenomena.

Upgrades to the proposal guidelines and the cooperative agreements are on hold until the Academic Fleet Review (AFR) is complete.

In 2001 all proposals must be submitted through FastLane. Some attempts to submit through FastLane this year were successful, but others experienced some difficulties.

The AFR is moving on and the next meeting is scheduled for the first week of December. The way NSF finances the fleet is receiving considerable attention in this process. The committee's report should be out by the end of September.

Office of Oceanographer of the Navy (OON) - Dr. Patrick Dennis represented the Office of the Oceanographer of the Navy. RADM Jerry Ellis has relieved RADM Paul Tobin as the Oceanographer of the Navy. Also, it was announced that Dr. Richard Spinrad, currently working for JOI/CORE, will become the Technical Director on the Oceanographer's staff. It is expected that Dr. Spinrad will assume his new position in February 1999.

Navy's oceanographic survey ship modernization and replacement program is nearing completion. USNS MATTHEW HENSON (T-AGS 63) was recently delivered, USNS BRUCE C. HEEZEN (T-AGS 64) will be launched in March 1999, and the sixth and final PATHFINDER Class ship (T-AGS 65) was included in the FY99 DOD Appropriations Bill. The contract for construction of PATHFINDER by Halter Marine shipyard in Moss Point, MS will be awarded in December 1998.

Office of Naval Research (ONR) - Sujata Millick presented the report for ONR. She introduced Tim Pfeiffer as the new IPA replacing Andy Silver, who has returned to his original assignment at Carderock Naval Surface Warfare Center.

ONR's budget for UNOLS vessel operations this year is $5.4M.

The DSV Sea Cliff has been transferred to WHOI. An engineering study is underway to examine various strategies for the best use of the vehicle.

Naval Oceanographic Office (NAVOCEANO) - CDR Jim Trees represented NAVO, see ***Appendix IV***. The Navy is very pleased with the processed data and the ship time that they have received from UNOLS. The easy assignments are in the process of being completed and efforts will now shift to accomplishing some of the more difficult tasks like developing mechanisms for utilizing the UNOLS fleet in foreign state EEZ's. In addition NAVO is working to market their relationship with UNOLS to their customers, which includes other Federal agencies.

National Oceanographic and Atmospheric Administration (NOAA) - CDR Elizabeth White introduced Capt. Warren Taguchi, NOAA Pacific Marine Center, and Lt. Mark Sramek, Honolulu Port Captain, and reported on NOAA activities. A number of personnel changes have taken place at NOAA and OAR. A new Deputy Undersecretary, Scott Gudes, has been appointed, the Assistant Administrator for OAR is now Dr. Dave Evans, and the Deputy Assistant Administrator for OAR is Louisa Koch. RON BROWN has completed a full year of operation and CHAPMAN has been decommissioned. The University of Puerto Rico is now operating CHAPMAN.

CHAPMAN has been replaced by GORDON GUNTER, which is operating out of the Southeast NMFS Lab in Pascagoula, MS. The title has been transferred on MALCOLM BALDRIDGE and the disposal proposals are being received for DISCOVERER.

A new NOAA brochure on the Oceans was presented and a limited number of copies were made available.

The Coastal Ocean Program (COOP) is now a part of the National Ocean Service (another of NOAA's Line Offices). There were no increases in the OAR or NOS budgets for ship time in the '99 appropriation. COOP and NSF are negotiating what to do about the jointly funded cruises scheduled for next year. CDR White was available to provide a point of contact in COOP to discuss ship time for GLOBEC and ECOHAB.

U.S. Coast Guard (USCG) - CDR George Dupree, LCDR Steve Wheeler and Dr. Jonathan Berkson represented the Coast Guard. CDR Dupree reported on the status of the Polar class vessels (***Appendix V***). POLAR STAR and POLAR SEA are participating in Operation Deep Freeze on alternating years. POLAR SEA will be on Deep Freeze deployment beginning early November. In addition both ships had Arctic deployments last year. POLAR SEA participated in the International Oil Spill Exercise, which involved the U.S. and Japan and was coordinated by the Russians.

HEALY is scheduled for delivery on 30 June 1999. The first science year will be 2001.

LUNCH

AGENCY REPORTS - Continued

U.S. Coast Guard - Cdr. Dupree continued his presentation on HEALY. The primary mission for the ship is to provide a high latitude research vessel for the science community. The secondary mission is to conduct other multi-mission requirements like SAR, logistical support, marine environmental protection, etc. The ship will cruise at 12.5 kts. Unlike the Polar class vessels HEALY does not have turbines or CP propellers, but it does have a bow thruster. HEALY will carry a crew of 67 and an eight person aviation detachment. The scientific complement is 35 with a 15-person surge capacity.

The vessel endurance is 180 days and it can operate in –50° F weather. The ship will have a fully functional ECDIS system and they are working with National Inventory Mapping Agency to develop maps for the Polar region.

The ship will have 20m coring capabilities from the stern and quarter and they are working on a design to conduct 30m coring activities. The ship will have a 20' boom for collecting air quality samples out side of the bow wake. Civilian employees will manage all major systems on the vessel.

U.S. State Department - Tom Cocke reported on activities within the State Department. Thanks were extended to UNOLS, The Ocean Studies Board and CORE for giving the support needed to acquire funds from NOAA, NSF, and ONR to hire a full time assistant. Mr. Cocke introduced Liz Maruschak, who will be working on clearances along with Tom. Ms. Maruschak briefly reviewed her plans for the office and their computer system.

Special Reports

SACLANT Undersea Research Center - Chris Gobey reported on the activities of SACLANT and their research vessels, ALLIANCE, and a 60' Army T-boat. ALLIANCE carries a German, British, and Italian crew and the smaller vessel has an all Italian crew. Last year ALLIANCE logged 170 days at sea on NATO cruises and an additional 70 days on private charter. They are looking for funding to replace the smaller vessel.

ALLIANCE is ISM certified and has under gone the 1st annual audit.

Chris relayed an incident in which a major whale stranding was blamed on seismic activities conducted on board ALLIANCE. The cause of the stranding was never confirmed, but as a result of this incident, in the future, a full environmental scope study must be performed before every acoustic, or any other survey.

Canadian Coast Guard - Terry Tebb represented the Canadian Coast Guard. Since the 1995 merging of the Canadian Coast Guard and the Fisheries fleet there has been a 25% reduction in support for this agency. They provide vessel support to the national research institutions and to Canadian universities through a grant system. They are in the process of obtaining ISM certification and they anticipate that it will be difficult to maintain, but feel that it will be worth the effort. All crew on Canadian Coast Guard vessels are licensed and meet STCW requirements.

The Canadian Coast Guard will be adding a science vessel on the east coast, a new buoy tender on the west coast, and doing a major science up grade on another vessel. They have a total of 112 ships operating nationally, 22 of them are on the West Coast.

Netherlands Institute for Sea Research (NIOZ) - Dr. Marieke Rietveld spoke about their experiences with the charter of their vessels to commercial firms. The pitfalls associated with conducting commercial charters were highlighted and examples of how to deal with each scenario were provided through NIOZ's experience with the charter of their vessel to a consortium of 17 oil companies (***Appendix VI***). Some suggestions for preparing a contract were given: set up a penalty clause for late payment, avoid subcontracting, stick to a standard C/P (common provide), evaluate the use of a simple Data Exchange Contract, always consult with your insurance carrier, and never sign a contract that contains requirements that you cannot provide.

BPP Technology – Kemal Sinatra updated the group on the activities of the BPP. The former head of the BPP is now the President of the Republic of Indonesia. This should

result in added support for ocean research. From 1990-98 the agencies four vessels participated in 80 missions in conjunction with institutions from France, Norway, U.S., Australia, and numerous commercial entities.

The agencies four vessels are all similar. They are 60m x 12m and are equipped to conduct a variety of surveys, including hydrographic (multi-beam) and fisheries surveys.

Research Vessel Updates:

University of Hawaii - Robert Hinton provided a status report on the SWATH AGOR 26, see ***Appendix VII***. Halter Marine began as the odds on favorite to build the replacement for MOANA WAVE but Lockheed Martin in association with Ingall's Shipyard got the contract. Acquisition reform was largely responsible for the contract going to Lockheed Martin. The initial design contract was for $1M. and they were to meet the requirements established by UNOLS for this class vessel. Their analysis of the mission requirements lead them to the AGOR 23 class, but these were difficult to meet in a SWATH vessel. The cost of this vessel would be twice as much as the $36M available to build the ship. Ingall's then agreed to continue working on the detailed design of the vessel but will accommodate a search for a more economical way to get the vessel built.

A bid package is now being prepared to submit to other yards for their evaluation. This has delayed the project by three months. The bid packages should have gone out in the middle of November and responses are requested before the middle of December. Of $45M allocated for the vessel there is only $25M available for the actual construction of the ship.

The ship is a 2,500T vessel with a 100T science payload with a 10,000 nautical mile range. The vessel will be built to commercial standards instead of Navy standards. All packages will be worked over the stern or over the bow. Crew size is between 16 and 18 and the ship will carry 30 scientists.

Great Lakes Science Center – Bob Nester provided an over view of their fleet of vessels and their attempts to purchase a new boat. Jamestown Marine surveyed four of their vessels. After the survey, modifications were made to three of the vessels and a fourth was determined unfit for duty. The Center's newest boat was built in 1976. A design was presented for a 107' vessel with a 26' beam, ***Appendix VIII***. The vessel will be used primarily for fisheries cruises and has a construction cost of $3.2M. There are accommodations for three crew and seven scientists. The maximum duration is 17 days on a day boat basis, returning to the dock every evening. The vessel is scheduled to be completed in July/August 1999.

Final design drawings for the renovation of the Center's 100' STURGEON are complete, ***Appendix IX***. The refit will begin late in 1999 and is scheduled to be complete by June 2000.

Smithsonian Tropical Research Institute (STRI) – Jose Espino, Marine Superintendent, represented STRI. Jose gave a brief account of the Smithsonian Institute and the part that STRI plays in that organization. T he main objective of STRI is research in the tropics and the headquarters for the Institute are located in Panama City, Republic of Panama. They operate a number of research field stations on both sides of the Isthmus.

The Institute's vessel, URRACA, was obtained in 1994. It is a FRP hull, 96' in length. URRACA is a single crew vessel with a variable pitch propeller. A large part of the vessel's work is in support of diving activities and the ship carries two dive compressors.

Skidaway Institute of Oceanography – Steve Carignan provided a review of their progress on replacing BLUEFIN. ABS comments on their new vessel, SAVANNAH, were received in December. A total of 28 shipyards were identified as prospective bidders and seven bid packages were sent out. Washburn and Doughty in Booth Bay, ME was the only yard to submit a bid. Their bid was $2.4M, which was more than the amount appropriated for the construction of the vessel. Skidaway has negotiated the construction cost down to $2M but a contract has not been signed.

The new vessel will be 91' long and will have an endurance of 12 days.

University of Miami – David Powell represented the Marine Operations Department at the University of Miami. Their plans for the construction of a 96' aluminum catamaran are progressing. A design contract is in place and model tests have been completed. Bid packages were sent out to 14 yards in early October. About $3.5 M is available for the design and construction of the ship.

The catamaran will have dynamic positioning capabilities, a moon pool, and "A" frame on the main deck. There will be berthing for a maximum of 20 people and it will draw five feet of water. The vessel is expect to admeasure at under 100 tons. Cruising speed is planned for 12 knots. Certification will be USCG Subchapter T, ABS International loadline.

Monterey Bay Aquarium Research Institute – Steve Etchemendy provided new information on the repairs to WESTERN FLYER. The vessel operated successfully for seven months before cracks in the struts were discovered. Glosten Associates did a Global Finite Analysis to determine the stress points on the hull.

Bids packages for repairs to the vessel were sent to five yards. Bay Ship and Yacht on Alameda Island in San Francisco Bay, CA was the successful bidder. They have in house aluminum welding capabilities and significant expertise in this field which was an important factor in choosing a yard.

The price tag for the repairs is about $4M. Repairs include removing most of the machinery from the vessel and adding new frames in between every existing frame. Repairs were complicated by the sophisticated nature of the original construction of the

ship. Fiber optic cables were built into the original design of the vessel and are used to provide complete control of the engine room from the wheel house. In the aft portion of the ship the diameter of the lower hull was changed from 9' to 11' in order to carry the extra weight from the addition of extra frames and new strength members.

A videotape of WESTERN FLYER being removed from the water was shown at the break.

Insurance and Liability - Dennis Nixon, Risk Manager for the UNOLS fleet, reviewed maritime case history, insurance in the UNOLS fleet over the last year, and discussed issues regarding charters, ***Appendix X***.

The price of insurance is lower now then it has been in some time. The downward spiral in costs is still in place and may continue for some time. In 1991 insurance costs for the fleet were $1.5M compared to $1M in 1998. Total savings over the eight-year period beginning in 1991 are $1.1M.

The cost of insurance per person on each of the UNOLS vessels was presented.

Accidents caused by equipment failures resulting from non-Y2K compliance will not be covered by insurers.

A discussion of charters, leases and waivers followed. Indemnification agreements are usually not valid except under Admiralty Law. But both Texas and Louisiana have passed anti-indemnity laws. So in these two states indemnification agreements can not be used to hold the owner harmless from negligence on the part of the operator. In most other states indemnification agreements, which hold the owner harmless in accidents caused by negligence of the charterer or their employees, can be signed between the owner of a vessel and the charter of the vessel.

One issue that remains a problem is how to obtain hull insurance on government owned vessels when they are chartered to non-government entities. In most cases, underwriters will charge for an entire years hull insurance for the charter period even if this period is less then 12 months. Establishing a fair market value for R/Vs is very difficult. This makes it hard to establish a fair rate for coverage.

A number of significant cases from 1998 were discussed.

Evening Reception at Waikiki Aquarium

Thursday, 5 November 1998
Hawaiian Regent Hotel

NSF Ship Inspection Program - T. Blake Powell of Jamestown Marine (JMS) gave an update of the UNOLS Ship Inspection Program (***Appendix XI***). JMS is the service provider for the Ship Inspection Program and their philosophy is to facilitate information exchange among the operators. The company has experience in naval architecture, diving support services, technical reports, manuals, and videos.

JMS has inspected 17 vessels in the UNOLS fleet since September 1997. Vessels have been inspected from all three classes. The RVSS are used as the standards for the inspections along with CFR's, MARPOL, etc. Blake reviewed the most common discrepancies discovered during their inspections.

The goal for the inspection program for out years is to bring all UNOLS vessels into the current inspection cycle, share lessons learned in the inspection program with all vessels in the fleet, and to work to raise standards where needed.

Maritime Advisory Services (MAS) - Dr. Dale Hutchinson represented MAS. MAS was founded in response to a U.S. Coast Guard study which found that adequate medical services were not available for mariners when at sea. An overview of their facilities was given. For redundancy they operate out of two different phone company central offices located in two separate area codes. The MAS office has multiple phone lines, full backup emergency power and all accepted means for ship to shore communication. There are two separate response centers.

MAS offers evacuation services, full medical documentation, medical supply services, response training, along with other services.

A call was made for operators to send medical history forms to MAS.

Discussion followed on defibrillators. Automated external defibrillators (AED) were recommended over standard type defibrillators. Operators require about two-four hours of additional training after completion of basic CPR in order to use the units. They cost about $3,500. There are two different kinds of AED's, one is an automatic unit and one is an automated unit. The automated units were recommended. Most maritime companies are not carrying AED's now. Bi-phasic units were recommended.

MAS uses the Seafarers Health Improvement Programs (SHIPS) list as the basis for their pharmaceutical list.

STCW Awareness Training - Captain Kim Parker of ABS Marine Services provided a discussion of the new STCW regulations and what was required to comply with this new law. A detailed explanation of each section in the STCW Convention followed, see ***Appendix XII***. The original 1978 Convention has not been adhered to because the provisions were open to different interpretations, they made no provisions for implementation or enforcement, and lacked the ability to integrate developing technologies. The new regulations have explicit requirements for all facets of marine operations from seafarers to control states and training institutions.

Chapters of most importance to UNOLS operators are Chapters II-IV, VI, and VIII. These sections establish the minimum standards for masters, and deck and engineering personnel onboard vessels in different size categories (i.e. <500 grt, >750 kW, etc.). They also set safety, emergency, medical and survival training standards and address requirements for watch keepers. All transitional measures for STCW end on 1 Feb. 2002.

Lunch

International Safety Management (ISM) Code - Captain Kim Parker of ABS Marine Services provided details on the new code and the responsibilities of all entities involved (***Appendix XIII***). The objectives of ISM are to ensure safety at sea, prevent human injury or loss of life, and to avoid damage to the environment. The Safety Management System (SMS) is the backbone of ISM. It establishes procedures for safe ship operations, environmental protection practices, accident and nonconformity reporting, emergency preparation and response, and internal audits and management review. The SMS must establish commitment to take appropriate action, define purpose and establish a plan, ensure capability to perform in support of objectives, and continually evaluate, learn and improve.

The final step in implementation of ISM is certification. The certification process takes about 12-18 months. An external audit is necessary to determine that the SMS is in compliance with the ISM Code, and that it is being effectively implemented and is in use by the company's personnel, ashore and afloat. Before an audit is undertaken the company must show records from the company's annual internal audit. The auditors will look for objective evidence to demonstrate that the company's SMS has been functionally effective ashore for at least three months, and an SMS has been in operation onboard one ship in the fleet for the same amount of time.

ISM Certification is related only to management systems, it is not a hardware certification document. It focuses on the relationship between shore side and shipboard personnel.

Evening Buffet Dinner at Hawaii Maritime Museum,
Pier 7 Honolulu Harbor and visit to Research Vessels
Visit to University of Hawaii Marine Center

Friday, 6 November 1998
Hawaiian Regent Hotel

SPECIAL REPORTS-Continued

Layup Costs for Class I vessels - Tom Althouse provided an estimate for the layup costs for a Class I vessel, ***Appendix XIII***. ROGER REVELLE was used as the typical Class I vessel for the purpose of estimating these costs. A one year (12 month) layup would cost approximately $926,096. A total of nine full and part time employees (eight FTE's) would be required to maintain the vessel during the layup period for a total costs of $362,442.

Woods Hole Oceanographic Institute's SWATH - Joe Coburn provided an up date on their plans for the construction of a 100'-105' coastal research SWATH. Model tests conducted in Norway indicated that the new design will be significantly more sea kindly than much larger mono-hulls. It is expected to admeasure well under 300 domestic tons and may go under 200 gross tons.

Construction costs for the vessel is estimated at $7M. Approximately $450K has been spent on model test and design. The boat will carry a crew of five including the cook and will accommodate 12 scientists. The day rate will be $4-5 K/day.

Operating draft will be 13' and transit draft will be 9'6". Deck load is expected to be about 20 tons and the vessel will carry a limited winch suite.

Sea Education Association - Phil Sacks discussed their plans to replace WESTWARD. The new vessel will be a sail ship with a 280 ton displacement. Total construction cost is estimated at $5-6M. Funding will be through private sources. The vessel will be ABS class and USCG Inspected.

ROUND TABLE DISCUSSION

Marine Superintendents or their equivalents from member and guest organizations met to discuss issues of mutual interest. A summary of the topics discussed included:

- Update/comments on marine insurance program.
- Fleet description book for scientists outlining services and charges. Distribution to Program officers NOAA, NSF, ONR, etc.
- Standard of intoxication 33CFR95.020
- Diving emergencies on RVs in remote locations.
- Documentation of research vessels.

- NSF Cooperative Agreement
- STCW
- Discussion on ABS Certification.
- Operation of small R/Vs. When in the eyes of the Coast Guard do they become passenger vessels and subject to inspection?
- Should we have a committee for setting meeting agendas?
- Defibrillators and their application to the UNOLS fleet.
- Formal description of RVOC.
- More information on RVOC in the UNOLS Web site.
- Revision and updating of RVOC by-laws.
- Lay-ups and how the costs of lay-ups should be handled.

BUSINESS MEETING

Assignment to committees, panels and work groups:

- Paul Ljunggren and Steve Rabalais, were re-elected to serve a second term as Chair and Vice Chair.
- Tom Smith continues as Chair of the Safety Committee. Members include Joe Coburn, Tim Askew, Steve Rabalais, Bill Hahn, and Tom Althouse.
- Joe Coburn will continue as liaison to FIC and AICC.
- Lee Black, Linda Goad, and Mike Prince will work to continue collecting information on ancillary costs.
- Dave Powell will continue to serve as coordinator for the small boat compendium. Dennis Nixon, Dan Schwartz, Steve Carignan, and Blake Powell will serve as a review panel for the compendium.

There were no new action items.

Agenda items were discussed for meetings in 1999 and 2000. Potential agenda items were:

- Industry presentation on new products or services.
- GIS system discussion from MBARI.
- Foreign ports and the experiences of operators in foreign ports
- Fisheries oceanography and the future of RVOC involvement with the U.S. Fisheries Research fleet
- Condition Based Maintenance Program. Discussion of prototype program being tested at University of Washington.
- Should the format of the meeting be revised? Should Roundtable discussions be moved to the first day? Should work groups be assigned as at previous meetings?
- Workshop on the outcome of the National Science Board.
- Status of ship repair industry.
- Update of Y2K and a discussion of what instruments will be affected.
- Other suggestion were submitted in writing after the meeting.

Harbor Branch Oceanographic Institute will host the 1999 meeting and the University of Alaska will host the meeting in 2000. The dates for the meetings are to be determined.

Adjournment

The RVOC wishes to express its thanks to, Bill Coste and Barry Raleigh of University of Hawaii and the University of Hawaii Marine Operations staff for hosting this year's meeting.

APPENDIX 1

1998 RESEARCH VESSEL OPERATORS COMMITTEE MEETING AGENDA

University of Hawaii
Honolulu, Hawaii
0800 Wednesday, 4 November 1998
Hawaiian Regent Hotel

0800 Registration and Coffee/Pastry (Spouses/Guests Invited)

0830 Welcoming Remarks
- Bill Coste, Marine Superintendent
- Barry Raleigh, Dean of the School of Ocean and Earth Science and Technology (After Dr. Raleigh's remarks, spouses/guests will break out for social pursuits)
- Paul Ljunggren, Chairman, RVOC

0900 Old Business
- Minutes of the 1997 Meeting
- Medical Standards/Job Descriptions
- Primer on small research vessels

0930 New Business
- STCW

1000 Break

1020 Committee and liaison reports
- UNOLS, Jack Bash & UNOLS Chair, Dr. Robert Knox (SIO)
- Safety Committee, Tom Smith
- Ship Scheduling Committee, Mike Prince
- RVTECH
- FIC & AICC, Joe Coburn

1100 Agency Reports
- National Science Foundation - Dolly Dieter
- Office of the Oceanographer of the Navy- Dr. Pat Dennis
- Office of Naval Research - Sujata Millick, Tim Pfeiffer
- Naval Oceanographic Office - CDR Jim Trees, Gordon Wilkes
- NOAA - CDR Elizabeth White
- USCG - Cdr. George Dupree, LCDR Steve Wheeler, Dr. Jonathan Berkson
- U.S. State Department - Tom Cocke, Liz Maruschak
- Others

1130 Lunch

1300 Wednesday, 4 November 1998
Hawaiian Regent Hotel

1245 **Special Reports**

- Representatives from other countries:
  SACLANT - Chris Gobey
  Canadian Coast Guard
  Other Countries

- Research vessel updates; new construction, operations, engineering:

  New AGOR - University of Hawaii, Robert Hinton
  New Great Lakes research vessel acquisition for USGS-Bob Nester, Great Lakes Science Center
  Update on STRI operations- Harry Barnes and Jose Espino
  Skidaway Institute R/V replacement update- Steve Carignan
  RSMAS Catamaran- David Powell
  MBARI Update- Steve Etchemendy
  Other operators with special reports

(Note: Any reports not completed during the allotted time frame will be completed on the morning of 6 November.)

1515 **Break**

1530 **Insurance and Liability**

Report by Dennis Nixon on liability and insurance issues
Discussion of liability release forms.

1830-2100 **Reception at Waikiki Aquarium**

1998 RESEARCH VESSEL OPERATORS COMMITTEE MEETING AGENDA

University of Hawaii
Honolulu, Hawaii
0830 Thursday, 5 November 1998
Hawaiian Regent Hotel

0830 **NSF Ship Inspection Program**
Update on NSF Ship Inspection Program by T. Blake Powell of Jamestown Marine.

0915 **Medical Advisory System**
Update of medical services now offered by MAS presented by Dale Hutchins.
As of 1 July 1998 MAS was awarded the contract to provide medical advice to the UNOLS research vessels.

1000 **Break**

1015 **STCW Awareness Training**
Presented by ABS Captain Kim Parker of ABS Marine Services. This training seminar will provide knowledge of the impact of the 1995 Amendments to the International Convention on the Training and Certification of Watchkeeping for Seafarers. Issues to be discussed include transitional provisions, certification, new requirements and various training information.

1130 **Lunch**

1245 **Wrap up of STCW Seminar**

1315 **International Safety Management (ISM) Code**
Presented by Captain Kim Parker of ABS Marine Services. This seminar will provide an over view of the system, the International Safety Management (ISM) Code. What are the requirements of the ISM Code? How do you obtain certification and who can issue the certificates? What kinds of audits of your system are required? How does this apply to research vessels? What are the implications of being certificated and not being certificated with the increased emphasis of port state control? How do you go about implementing the ISM Code?

1700 **Visit to University of Hawaii Marine Center/Research Vessels**

1800-2030 **Buffet Dinner at Hawaii Maritime Museum, Pier 7 Honolulu Harbor**

1998 RESEARCH VESSEL OPERATORS COMMITTEE MEETING AGENDA

University of Hawaii
Honolulu, Hawaii
0830 Friday, 6 November 1998
Hawaiian Regent Hotel

0830 Unfinished business

1000 Round Table Discussion

The Round Table portion of our meeting is limited to the Marine Superintendents or their equivalents from the institutions represented at this meeting. Marine Superintendents will select and discuss topics of mutual interest.

Submit additional items that you would like to discuss, other items will be developed during the course of the meeting. Suggested round table topics:

- Update/comments on marine insurance program.
- Fleet description book for scientists outlining services and charges. Distribution to Program officers NOAA, NSF, ONR, etc.
- Standard of intoxication 33CFR95.020
- Post cruise evaluations
- Diving emergencies on RV's in remote locations
- Documentation of research vessels
- NSF Cooperative Agreement
- STCW
- Discussion on ABS certification. Of what value?
- Operation of small R/V's; when in the eyes of the Coast Guard do they become passenger vessels and subject to inspection.
- Should we have a committee for setting meeting agendas.

1130 Lunch

1200-1400 Luncheon aboard the SWATH Vessel NAVATEK for spouse/guests (optional $34). RVOC attendees who are interested in experiencing a SWATH vessel ride and who are not otherwise obligated are welcome to join the group.

1300 Continue Round Table

1400 **Business Meeting**

- Election of chairman and vice chairman
- Assignments to committees, panels and work groups
- Review of action items pending
- Suggestions for the 1999 Agenda and meeting format
- Vote on host for 2000 meeting

1500 **Adjourn**

NEXT YEAR'S RVOC MEETING

Please use this form before and during the meeting to record any suggestions you may have for next years meeting.

Suggestions for agenda items, workshops or guest speakers:

Suggestions for changes or improvements to the meeting format or schedule:

APPENDIX 2

RVOC CONFERENCE - NOVEMBER 4-6, 1998

NAME	INSTITUTION	ADDRESS	TELEPHONE/FAX/E-MAIL
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Espino, Jose	Smithsonian Tropical Research Institute	Unit 0948 APO AAA 34002-0948	(507)227-5211 (Panama) (202)786-2817 (D.C.) Fax:(507)232-6197 (Panama) espinoj@naos.si.edu
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TITLE 46--SHIPPING

Subtitle II--Vessels and Seamen

Part A--General Provisions

CHAPTER 21--GENERAL

Sec. 2101. General definitions

(18) ``oceanographic research vessel'' means a vessel that the Secretary finds is being employed only in instruction in oceanography or limnology, or both, or only in oceanographic or limnological research, including those studies about the sea such as seismic, gravity meter, and magnetic exploration and other marine geophysical or geological surveys, atmospheric research, and biological research.

TITLE 46, APPENDIX--SHIPPING

CHAPTER 14--INSPECTION OF STEAM VESSELS

SUBCHAPTER VII--OCEANOGRAPHIC RESEARCH VESSELS

Sec. 443. Vessel not engaged in trade or commerce

An **oceanographic research** vessel shall not be deemed to be engaged in trade or commerce.

(Pub. L. 89-99, Sec. 3, July 30, 1965, 79 Stat. 424.)

§ 24.10-20 Oceanographic research vessel.

An *oceanographic research vessel* is a vessel which the U.S. Coast Guard finds is employed exclusively in one or more of the following:

(a) Oceanographic instruction;
(b) Limnologic instruction;
(c) Oceanographic research; or
(d) Limnologic research.

[CGD 77-0811, 46 FR 56204, Nov. 16, 1981]

14.2 MAKEUP OF CREW

All motor boats and motor vessels carrying passengers for hire; those over 15 gross tons carrying freight for hire; seagoing motor vessels over 200 gross tons engaged in trade; and all motor vessels over 300 gross tons are required to have licensed personnel according to their size, capacity, trade routes, and other factors. The nature and number of licensed personnel is highly varied, ranging from a single motorboat operator to fully licensed masters, mates, and engineers on ships of larger size. Inspected oceanographic research vessels (over 300 tons) are required to carry licensed officers on watch at all times, and the qualifications and size of the crew are prescribed by the certificate of inspection (which also prescribes the maximum number of scientists allowed). Uninspected research vessels have no legal requirements concerning licensed personnel, nor limitations on the size of the scientific party, and this of course accounts for the large number of research vessels which are just under 300 tons in size. However, many operators of uninspected vessels insist on licensed personnel even though not legally required, or at least a mix of licensed and unlicensed personnel. Operators are urged to use the most qualified personnel available, consistent with their needs, and the needs of the scientific program. Skimping on personnel competence to reduce costs is very poor economy. (46 CFR 15)

APPENDIX 3

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Trees, Jim	Naval Oceanographic Office	1002 Balch Blvd. Stennis Sp. Ctr, MS 39522-5001	(228)688-4370 (228)688-5614
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Hawkins, Matthew	University of Delaware	700 Pilottown Road Lewes, DE 19958	(302)645-4320 (304)645-4006 hawkins@udel.edu
Hinton, Robert	University of Hawaii School of Ocean & Earth Science & Technology	266 Caspian Drive Sunnyvale, CA 94089	(408)756-1011 Same as phone, call first rmhinton@worldnet.att.net
Hoffer, Don	University of Rhode Island Graduate School of Oceanography	S. Ferry Road Narragansett, RI 02882	(401)874-6556 (401)874-6574 don@gsosun1.gso.uri.edu
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Jones, Fred	Oregon State University	College of Oceanic & Atomosp. Science P.O. Box 429 South Beach, OR 97366-0429	(541)867-0224 (541)867-0294 jonesf@ucs.orst.edu
Knox, Bob	Scripps Institute of Oceanography UCSD	Mail Code 0210 9500 Gilman Drive La Jolla, CA 92093-0210	(619)534-4729 (619)535-1817 rknox@ucsd.edu
Lee, Black	Bermuda Biological Station for Research, Inc.	17 Biological Station Lane Ferry Reach St. George's GE-01 BERMUDA	(441)297-1880 x208 (441)297-8142 lblack@bbsr.edu
Lewis, Quentin	Duke University Marine Laboratory Duke/UNC Oceanographic Consortium	135 Duke Marine Lab Road Beaufort, NC 28516	(919)504-7580 (919)504-7651 quentinl@duncoc.duke.mi.edu

Secretary means the Secretary of Transportation.

State means a State of the United States or a political subdivision thereof, Guam, Puerto Rico, the Virgin Islands, American Samoa, the District of Columbia, the Northern Mariana Islands, and any other territory or possession of the United States.

Superstructure means the main deck and any other structural part above the main deck.

United States, when used in a geographic sense means the States of the United States, Guam, Puerto Rico, the Virgin Islands, American Samoa, the District of Columbia, the Northern Mariana Islands, and any other territory or possession of the United States, except that for purposes of § 67.19(d)(3) trust territories are not considered to be part of the United States.

Vessel includes every description of watercraft or other contrivance capable of being used as a means of transportation on water, but does not include aircraft.

Wrecked vessel, under the provisions of 46 U.S.C. app. 14, means a vessel which:

(1) Has incurred substantial damage to its hull or superstructure as a result of natural or accidental causes which occurred in the United States or its adjacent waters; and

(2) Has undergone, in a shipyard in the United States or its possessions, repairs equaling three times the appraised salved value of the vessel.

[CGD 89–007, CGD 89–007a, 58 FR 60256, Nov. 15, 1993, as amended by CGD 95–014, 60 FR 31603, June 15, 1995; CGD 94–070, 60 FR 40241, Aug. 7, 1995; CGD 95–012, 60 FR 48050, Sept. 18, 1995]

§ 67.5 Vessels eligible for documentation.

Any vessel of at least five net tons wholly owned by a citizen or citizens of the United States is eligible for documentation under this part. This includes, but is not limited to, vessels used exclusively for recreational purposes and vessels used in foreign trade.

§ 67.7 Vessels requiring documentation.

Any vessel of at least five net tons which engages in the fisheries on the navigable waters of the United States or in the Exclusive Economic Zone, Great Lakes trade, or coastwise trade, unless exempt under § 67.9(c), must have a Certificate of Documentation bearing a valid endorsement appropriate for the activity in which engaged.

§ 67.9 Vessels excluded from or exempt from documentation.

(a) A vessel of less than five net tons is excluded from documentation.

(b) A vessel which does not operate on the navigable waters of the United States or in the fisheries in the Exclusive Economic Zone is exempt from the requirement to have a Certificate of Documentation.

(c) A non-self-propelled vessel, qualified to engage in the coastwise trade is exempt from the requirement to be documented with a coastwise endorsement when engaged in coastwise trade:

(1) Within a harbor;

(2) On the rivers or lakes (except the Great Lakes) of the United States; or

(3) On the internal waters or canals of any State.

(d) A vessel exempt from the requirement to be documented by paragraph (b) or (c) of this section may be documented at the option of the owner, provided it meets the other requirements of this part.

§ 67.11 Restriction on transfer of an interest in documented vessels to foreign persons; foreign registry or operation.

(a) Unless approved by the Maritime Administration—

(1) A documented vessel or a vessel last documented under the laws of the United States may not be placed under foreign registry or operated under the authority of a foreign country.

(2) A documented vessel or a vessel last documented under the laws of the United States owned by a citizen of the United States as defined in section 2 of the Shipping Act, 1916 (46 U.S.C. app. 802), may not be sold, mortgaged, leased, chartered, delivered, or otherwise transferred to any person who is not a citizen of the United States as defined in section 2 of the Shipping Act, 1916 (46 U.S.C. app. 802).

Method of propulsion	Size or other limitations [1]	Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [3, 4, 5] or Subchapter T—Small Passenger Vessels [3, 4]	and certificated under Subchapter I—Cargo and Miscellaneous Vessels [3, 5]	provisions of ... chapter C—Uninspected Vessels [3, 6, 8]	chapter O—Oceanographic Research Vessels [3, 6, 9]	... tar
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	
.....	.....		c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.				
Motor	Vessels not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers. [7]	Those vessels carrying dangerous cargoes when required by 46 CFR part 98 or 40 CFR parts 171-179.	All vessels except those covered by columns 3, 4, 5, and 7.	Dive	
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk. [7]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers. [7]	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, 5, and 7.	None	

§ 8304. Implementing the Officers' Competency Certificates Convention, 1936

- (a) In this section, "high seas" means waters seaward of the Boundary Line.
- (b) The Officers' Competency Certificates Convention, 1936 (International Labor Organization Draft Convention Numbered 53, on the minimum requirement of professional capacity for masters and officers on board merchant vessels), as ratified by the President on September 1, 1938, with understandings appended, and this section apply to a documented vessel operating on the high seas except -
    - (1) a public vessel;
    - (2) a wooden vessel of primitive build, such as a dhow or junk;
    - (3) a barge; and
    - (4) a vessel of less than 200 gross tons.
- (c) A person may not engage or employ an individual to serve as, and an individual may not serve as, a master, mate, or engineer on a vessel to which this section applies, if the individual does not have a license issued under section 7101 of this title authorizing service in the capacity in which the individual is to be engaged or employed.
- (d) A person (including an individual) violating this section is liable to the United States Government for a civil penalty of $100.
- (e) A license issued to an individual to whom this section applies is a certificate of competency.
- (f) A designated official may detain a vessel to which this section applies (by written order served on the owner, charterer, managing operator, agent, master, or individual in charge of the vessel) when there is reason to believe that the vessel is about to proceed from a port of the United States to the high seas in violation of this section or a provision of the convention described in subsection (b) of this section. The vessel may be detained until the vessel complies with this section. Clearance may not be granted to a vessel ordered detained under this section.
- (g) A foreign vessel to which the convention described in subsection (b) of this section applies, on the navigable waters of the United States, is subject to detention under subsection (f) of this section, and to an examination that may be necessary to decide if there is compliance with the convention.
- (h) The owner, charterer, managing operator, agent, master, or individual in charge of a vessel detained under subsection (f) or (g) of this section may appeal the order within 5 days as provided by regulation.
- (i) An officer or employee of the Customs Service may be designated to enforce this section.

46 CFR 15.701 refers to documented vessels

ballast control operator

e OCMI issuing the MODU's cer- of inspection may authorize stitution of chief or assistant (MODU) for chief or assistant respectively, on self-pro- or propulsion assisted surface except drillships. The OCMI may thorize the substitution of as- engineer (MODU) for assistant on drillships.

equirements in this part con- radar observers do not apply to -propelled MODUs.

surface mobile offshore drilling derway or on location, when nd equipped with a ballast con- m, must have that ballast con- om manned by an individual a license or endorsement au- g service as ballast control op-

059a, 55 FR 14805, Apr. 18, 1990]

Reference to other parts.

31 and 35 of this chapter con- ditional manning requirements ble to tank vessels.

rt E—Manning Require- ents; Uninspected Vessels

General

ollowing sections of subparts F, H of this part contain provisions ting manning of uninspected §§ 15.701, 15.705, 15.710, 15.720, 5.801, 15.805, 15.810, 15.820, 15.825, 15.850, 15.855, 15.905, 15.910, and

Licensed operators for nspected passenger vessels.

self-propelled, uninspected ves- rying not more than six pas- as defined by 46 U.S.C. (D), must be under the direction and control of an individual li- censed by the Coast Guard. This does not apply to a vessel of less than 200 gross tons engaged in the offshore min- eral and oil industry if the vessel has offshore mineral and oil industry sites or equipment as its ultimate destina- tion or place of departure.

Subpart F—Limitations and Qualifying Factors

§ 15.701 Officers Competency Certificates Convention, 1936.

(a) This section implements the Officers Competency Certificates Convention, 1936, and applies to each vessel documented under the laws of the United States navigating seaward of the Boundary Lines in part 7 of this chapter, except:

(1) A public vessel;

(2) A wooden vessel of primitive build, such as a dhow or junk;

(3) A barge; and,

(4) A vessel of less than 200 gross tons.

(b) The master, mates and engineers on any vessel to which this section applies must hold a license to serve in that capacity issued by the Coast Guard under part 10 of this chapter.

(c) A vessel to which this section applies, or a foreign flag vessel to which the Convention applies, may be detained by a designated official until that official is satisfied that the vessel is in compliance with the Convention. *Designated official* includes Coast Guard officers, Coast Guard petty officers and officers or employees of the Customs Service.

(d) Whenever a vessel is detained, the owner, charterer, managing operator, agent, master, or individual in charge may appeal the detention within five days under the provisions of § 2.01-70 of this chapter.

46 CFR 10.705 states simply "see 46 USC 8104"

TITLE 46--SHIPPING

Subtitle II--Vessels and Seamen

Part F--Manning of Vessels

CHAPTER 81--GENERAL

Sec. 8104. Watches

(a) An owner, charterer, managing operator, master, individual in charge, or other person having authority may permit an officer to take charge of the deck watch on a vessel when leaving or immediately after leaving port only if the officer has been off duty for at least 6 hours within the 12 hours immediately before the time of leaving.

(b) On an oceangoing or coastwise vessel of not more than 100 gross tons (except a fishing, fish processing, or fish tender vessel), a licensed individual may not be required to work more than 9 of 24 hours when in port, including the date of arrival, or more than 12 of 24 hours at sea, except in an emergency when life or property are endangered.

(c) On a towing vessel (except a towing vessel operated only for fishing, fish processing, fish tender, or engaged in salvage operations) operating on the Great Lakes, harbors of the Great Lakes, and connecting or tributary waters between Gary, Indiana, Duluth, Minnesota, Niagara Falls, New York, and Ogdensburg, New York, a licensed individual or seaman in the deck or engine department may not be required or permitted to work more than 8 hours in one day, except in an emergency when life or property are endangered.

(d) On a merchant vessel of more than 100 gross tons (except a vessel only operating on rivers, harbors, lakes (except the Great Lakes), bays, sounds, bayous, and canals, a fishing, fish tender, or whaling vessel, a fish processing vessel of not more than 5,000 gross tons, yacht, or vessel engaged in salvage operations), the licensed individuals, sailors, coal passers, firemen, oilers, and water tenders shall be divided, when at sea, into at least 3 watches, and shall be kept on duty successively to perform ordinary work incident to the operation and management of the vessel. The requirement of this subsection applies to radio officers only when at least 3 radio officers are employed. A licensed individual or seaman in the deck or engine department may not be required to work more than 8 hours in one day.

(e) On a vessel designated by subsections (c) and (d) of this section--

(1) a seaman may not be--

(A) engaged to work alternately in the deck and engine departments; or

(B) required to work in the engine department if engaged for deck department duty or required to work in the deck department if engaged for engine department duty;

(2) a seaman may not be required to do unnecessary work on Sundays, New Year's Day, July 4th, Labor Day, Thanksgiving Day, or

(1) Every self-propelled, seagoing documented vessel of 200 gross tons and over.

(2) Every self-propelled inspected vessel.

(3) Every inspected passenger vessel.

(4) Every inspected small passenger vessel.

(b) Every vessel documented under the laws of the United States must be under the command of a U.S. citizen.

[CGD 81–059, 52 FR 28623, Oct. 16, 1987, as amended by CGD 81–059, 54 FR 149, Jan. 4, 1989]

§ 15.310 Mates.

(a) The OCMI determines the minimum number of licensed mates required for the safe operation of inspected vessels.

(b) The minimum number of licensed mates required to be carried on every inspected, self-propelled, seagoing and Great Lakes vessel, and every inspected, seagoing, passenger vessel must not be less than the following, except when reductions are authorized under paragraph (e) of this section:

(1) Vessels of 1000 gross tons or more (except MODUs)—three licensed mates (except when on a voyage of less than 400 miles from port of departure to port of final destination—two licensed mates).

(2) MODUs of 1000 gross tons or more:

(i) Three licensed mates when on a voyage of more than 72 hours.

(ii) Two licensed mates when on a voyage of more than 16 but not more than 72 hours.

(iii) One licensed mate when on a voyage of not more than 16 hours.

(3) Vessels of 100 or more gross tons but less than 1000 gross tons—two licensed mates (except vessels of at least 100 but less than 200 gross tons on voyages which do not exceed 24 hours in duration—one licensed mate).

(4) All offshore supply vessels of 100 gross tons or more—two licensed mates (except when on a voyage of less than 600 miles—one licensed mate). A voyage includes the accrued distance from port of departure to port of arrival and does not include stops at offshore points.

(5) All vessels of less than 100 gross tons—one licensed mate (except vessels on voyages not exceeding 12 hours in duration may, if the OCMI determines it to be safe, be operated without licensed mates).

(c) An individual in charge of the navigation or maneuvering of a self-propelled, uninspected, documented, seagoing vessel of 200 gross tons or over must hold an appropriate license authorizing service as mate.

(d) The OCMI may increase the minimum number of mates indicated in paragraph (b) of this section where he or she determines that the vessel's characteristics, route, or other operating conditions create special circumstances warranting an increase.

(e) The Commandant will consider reductions to the number of mates required by this section when special circumstances allowing a vessel to be safely operated can be demonstrated.

[CGD 81–059, 52 FR 28652, Oct. 16, 1987, as amended by CGD 81–059, 54 FR 149, Jan. 4, 1989; CGD 81–059a, 55 FR 14805, Apr. 13, 1990]

§ 15.312 Pilots

(a) Except as specified in paragraph (f) of this section, the following vessels, not sailing on register, when underway on the navigable waters of the United States, must be under the direction and control of an individual qualified to serve as pilot under paragraph (b) or (c) of this section as appropriate:

(1) Coastwise seagoing vessels propelled by machinery and subject to inspection under 46 U.S.C. Chapter 33, and coastwise seagoing tank barges subject to inspection under 46 U.S.C. Chapter 37;

(2) Vessels that are not authorized by their Certificate of Inspection to proceed beyond the Boundary Line established in part 7 of this Chapter which are in excess of 1,600 gross tons, propelled by machinery, and subject to inspection under 46 U.S.C. chapter 33; and

(3) Vessels operating on the Great Lakes that are propelled by machinery and subject to inspection under 46 U.S.C. chapter 33, or are tank barges subject to inspection under 46 U.S.C. chapter 37.

(b) The following individuals may serve as a pilot for a vessel subject to paragraph (a) of this section, when underway on the navigable waters of the United States that are designated areas.

(1) When operating from 60°49′ North latitude to the Port of Valdez be under the direction and control of a federally licensed pilot who:

(i) Is operating under the Federal license;

(ii) Holds a license issued by the State of Alaska; and

(iii) Is not a member of the crew of the vessel.

(2) Navigate with either two licensed deck officers on the bridge or a federally licensed pilot when operating South of 60°49′ North latitude and in the approaches through Hinchinbrook Entrance and in the area bounded:

(i) On the West by a line one mile west of the western boundary of the Traffic Separation Scheme;

(ii) On the East by 146°00′ West longitude;

(iii) On the North by 60°49′ North latitude; and

(iv) On the South by that area of Hinchinbrook Entrance within the territorial sea bounded by 60° 07′ North latitude and 146°31.5′ West longitude.

[CGD 84–060, 59 FR 4842, Feb. 2, 1994, as amended by CGD 84–060, 60 FR 20652, 20653, Apr. 27, 1995]

§ 15.315 Radar observers.

(a) Each person in the required complement of licensed deck individuals, including the master, on inspected vessels of 300 gross tons or over which are radar equipped, shall hold a valid endorsement as radar observer.

(b) Each person who is employed or serves as pilot in accordance with Federal law on board vessels of 300 gross tons or over which are radar equipped, shall hold a valid endorsement as radar observer.

(c) On or after June 1, 1995, each person having to be licensed under 46 U.S.C. 8904(a) for employment or service as master, mate, or operator on board an uninspected towing vessel of 8 meters (approximately 26 feet) or more in length shall, if the vessel is equipped with radar, hold—

(1) A valid endorsement as radar observer; or,

(2) If the person holds a valid license dated before June 1, 1995, a valid certificate from a Radar-Operation course.

[CGD 81–059, 52 FR 23652, Oct. 16, 1987, as amended by CGD 94–041, 60 FR 3209, Feb. 14, 1995]

§ 15.320 Chief engineer.

(a) There must be an individual holding an appropriate license as chief engineer or a license authorizing service as chief engineer employed on board the following inspected mechanically propelled vessels:

(1) Seagoing or Great Lakes vessels of 200 gross tons and over.

(2) Offshore supply vessels of more than 200 gross tons.

(3) Inland (other than Great Lakes) vessels of 300 gross tons and over, if the OCMI determines that a licensed individual responsible for the vessel's mechanical propulsion is necessary.

(b) An individual engaged or employed to perform the duties of chief engineer on a mechanically propelled, uninspected, seagoing, documented vessel of 200 gross tons or over must hold an appropriate license authorizing service as a chief engineer.

§ 15.325 Engineers.

(a) An individual in charge of an engineering watch on a mechanically propelled, seagoing, documented vessel of 200 gross tons or over, other than an individual described in § 15.320, must hold an appropriate license authorizing service as an assistant engineer.

(b) The Officer in Charge, Marine Inspection determines the minimum number of licensed engineers required for the safe operation of inspected vessels.

§ 15.330 Radio officers.

Radio officers are required on certain merchant vessels of the United States. The determination of when a radio officer is required is based on the Federal Communications Commission requirements.

§ 15.335 Staff officers.

Staff officers, when carried, must be registered as specified in part 10 of this chapter.

the crew by the licensed individuals in the language ordinarily and customarily used by the licensed individuals. The orders must be spoken directly by the licensed individual to the crew member and not through an interpreter. Signs, gestures, or signals may not be used in the test. The Coast Guard representative will specify the orders to be given and will include not only daily routine but orders involving emergencies, either of a departmental or of a general nature. This test will be conducted, if possible, at a time reasonably in advance of the vessel's departure, to avoid delays.

Subpart G—Computations

§ 15.801 General.

The OCMI will determine the specific manning levels for vessels required to have certificates of inspection by part B of subtitle II of title 46 U.S.C. The masters or individuals in command of all vessels, whether required to be inspected under 46 U.S.C. 3301 or not, are responsible for properly manning vessels in accordance with the applicable laws, regulations, and international conventions.

[CGD 81-059, 54 FR 149, Jan. 4, 1989]

§ 15.805 Master.

(a) There must be an individual hold-

§ 15.340 Able seamen.

(a) With certain exceptions, 46 U.S.C. 8702 applies to all vessels of at least 100 gross tons. At least 65 percent of the deck crew of these vessels, excluding licensed individuals, must be able seamen. For vessels permitted to maintain a two watch system, the percentage of able seamen may be reduced to 50 percent.

(b) Able seamen are rated as: unlimited, limited, special, offshore supply vessel, sail, and fishing industry, under the provisions of part 12 of this chapter. 46 U.S.C. 7312 specifies the categories of able seamen (i.e., unlimited, limited, etc.) necessary to meet the requirements of 46 U.S.C. 8702.

(c) It is the responsibility of the master or person in charge to ensure that the able seamen in the service of the vessel meet the requirements of 46 U.S.C. 7312 and 8702.

§ 15.345 Lifeboatmen.

The number of lifeboatmen required for a vessel are specified in the parts of the regulations dealing with the inspection of that specific type of vessel.

§ 15.350 Lookouts.

The requirements for the maintenance of a proper lookout are specified in Rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, and Rule 5 of the Inland Navigational Rules Act of 1980 (33 U.S.C. 2005). Lookout is a function to be performed by a member of a navigational watch.

§ 15.355 Cabin watchmen and fire patrolmen.

(a) On vessels carrying passengers at night, the master or person in charge shall ensure that a suitable number of watchmen are in the vicinity of the cabins or staterooms and on each deck, to guard against and give alarm in case of fire or other danger.

(b) On a fish processing vessel of more than 100 gross tons, there must be a suitable number of watchmen trained in firefighting on board when hot work is being done, to guard against and give alarm in case of a fire.

§ 15.360 Tankerman.

(a) The Officer in Charge, Marine Inspection, enters on the Certificate of Inspection issued to each manned tank vessel subject to the regulations in this chapter the number of crewmembers required to hold valid merchant mariners' documents with the proper tankerman endorsement. Table 15.360(a)(1) provides the minimal requirements for tankermen aboard manned tank vessels; Table 15.360(a)(2) provides the tankerman endorsements required for personnel aboard tankships.

(b) For each tankship of more than 5,000 gross tons certified for voyages beyond the Boundary Line:

(1) The number of "Tankerman-PICs" or restricted "Tankerman-PICs" carried must be not fewer than two.

(2) The number of "Tankerman-Assistants" carried must be not fewer than three.

(3) The number of "Tankerman-Engineers" carried must be not fewer than two.

(c) For each tankship of 5,000 gross tons or less certified for voyages beyond the Boundary Line:

(1) The number of "Tankerman-PICs" or restricted "Tankerman-PICs" carried must be not fewer than two.

(2) The number of "Tankerman-Engineers" carried must be not fewer than two, unless only one engineer is required, in which case the number of "Tankerman-Engineers" carried may be just one.

(d) For each tankship not certified for voyages beyond the Boundary Line, if the total crew complement is:

(1) One or two, the number of "Tankerman-PICs" or restricted "Tankerman-PICs" carried may be just one.

(2) More than two, the number of "Tankerman-PICs" or restricted "Tankerman-PICs" carried must be not fewer than two.

(e) For each tank barge manned under §31.15–5 of this chapter, if the total crew complement is:

(1) One or two, the number of "Tankerman-PICs", restricted "Tankerman-PICs", "Tankerman-PICs (Barge)", or restricted "Tankerman-PICs (Barge)" carried may be just one.

Article III

Application

The Convention shall apply to seafarers serving on board seagoing ships entitled to fly the flag of a Party except to those serving on board:

(a) warships, naval auxiliaries or other ships owned or operated by a State and engaged only on governmental non-commercial service; however, each Party shall ensure, by the adoption of appropriate measures not impairing the operations or operational capabilities of such ships owned or operated by it, that the persons serving on board such ships meet the requirements of the Convention so far as is reasonable and practicable;

(b) fishing vessels;

(c) pleasure yachts not engaged in trade; or

(d) wooden ships of primitive build.

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* The name of the Organization was changed to "International Maritime Organization (IMO)" by virtue of amendments to the Organization's Convention which entered into force on 22 May 1982.

Section A-VIII/2

Watchkeeping arrangements and principles to be observed

PART 1 – CERTIFICATION

1 The officer in charge of the navigational or deck watch shall be duly qualified in accordance with the provisions of chapter II, or chapter VII appropriate to the duties related to navigational or deck watchkeeping.

2 The officer in charge of the engineering watch shall be duly qualified in accordance with the provisions of chapter III, or chapter VII appropriate to the duties related to engineering watchkeeping.

Subpart J—Vessels Subject to Requirements of STCW

§ 15.1101 General.

(a) *Definitions.* For purposes of this subpart, the term—

(1) *STCW* means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995;

(2) *STCW Code* means the Seafarer's Training, Certification and Watchkeeping Code;

(3) *Seagoing vessel* means a self-propelled vessel in commercial service that operates beyond the Boundary Line established by 46 CFR part 7. It does not include a vessel that navigates exclusively on inland waters;

Subpart I—Vessels In Foreign Trade

AUTHORITY: 46 U.S.C. 2103, 3703, 8101, 8102, 8104, 8301, 8304, 8502, 8503, 8701, 8702, 8901, 8902, 8903, 8904, 8905(b), 9102; 49 CFR 1.45 and 1.46.

SOURCE: CGD 81-059, 52 FR 38652, Oct. 16, 1987, unless otherwise noted.

Subpart A—Purpose and Applicability

§ 15.101 Purpose of regulations.

The purpose of the regulations in this part is to set forth uniform minimum requirements for the manning of vessels. In general, they implement, interpret, or apply the specific statutory manning requirements in title 46, U.S.C., parts E & F, implement various international conventions which affect merchant marine personnel, and provide the means for establishing the complement necessary for safe operation of vessels.

§ 15.103 General.

(a) The regulations in this part apply to all vessels which are subject to the manning requirements contained in the navigation and shipping laws of the United States, including uninspected vessels (46 U.S.C. 7101-9308).

(b) The navigation and shipping laws state that a vessel may not be operated unless certain manning requirements are met. In addition to establishing a complement of licensed officers and crew (and in some cases, a minimum number of hours that must be spent aboard vessel), the Coast Guard inspects vessels to determine the number and type of lifesaving, firefighting, and other equipment (including hull and machinery) considered necessary for safe operation. The certificate of inspection complements the statutory requirements but does not supersede them.

Subpart B—Definition of Terms

§ 15.301 Definitions of terms used in this part.

(a) The following terms defined in this subpart apply only to the manning of vessels subject to the manning provisions in the navigation and shipping laws of the United States:

Assistance Towing means towing a disabled vessel for consideration.

Coastwise seagoing vessel means a vessel that is authorized by its Certificate of Inspection to proceed beyond the Boundary Line established in part 7 of this chapter.

Deck crew (excluding licensed individuals) means, as used in 46 U.S.C. 8702, only the following members of the deck department below the grade of licensed individual: Able seamen and ordinary seamen.

Designated areas means those areas within pilotage waters for which first class pilot's licenses or endorsements are issued under part 10, subpart G, of this Chapter, by the Officer in Charge, Marine Inspection (OCMI). The areas for which first class pilot's licenses or endorsements are issued within a particular Marine Inspection Zone and the specific requirements to obtain them may be obtained from the OCMI concerned.

Officer in Charge, Marine Inspection (OCMI) for the purposes of part 15

§ 15.103 General.

* * * * *

(c) The regulations in subpart I of this part apply to seagoing vessels subject to the International Convention on Standards of Training, Certification and watchkeeping for Seafarers as amended in 1995 (STCW).

(e) Neither any person serving on any of the following vessels, nor any owner or operator of any of these vessels, need meet the requirements of subpart I, because the vessels are exempt from application of STCW:

(1) Uninspected passenger vessels as defined in 46 U.S.C. 2101(42).

(2) Fishing vessels as defined in 46 U.S.C. 2101(11)(a).

(3) Fishing vessels used as fish-tender vessels as defined in 46 U.S.C. 2101(11)(c).

(4) Barges as defined in 46 U.S.C. 2101(2), including non-self-propelled mobile offshore-drilling units.

(5) Vessels operating exclusively on the Great Lakes.

(f) Personnel serving on the following vessels, and the owners and operators of these vessels, are in compliance with subpart I and are not subject to further obligation for the purposes of STCW, on account of the vessels' special operating conditions as small vessels engaged in domestic voyages:

(1) Small passenger vessels subject to subchapter T or K of title 46, CFR.

(2) Vessels of less than 200 GRT (other than passenger vessels subject to subchapter H of title 46 CFR).

(g) Licensed personnel serving on vessels identified in paragraphs (e)(3), (f)(1), and (f)(2) of this section will be

§ 15.1109 Watches.

Each master of a vessel that operates beyond the Boundary Line shall ensure observance of the principles concerning watchkeeping set out in STCW Regulation VIII/2 and section A-VIII/2 of the STCW Code.

§ 15.1111 Work hours and rest periods.

(a) After January 31, 1997, each person assigned duty as officer in charge of a navigational or engineering watch, or duty as a rating forming part of a navigational or engineering watch, on board any vessel that operates beyond the Boundary Line shall receive a minimum of 10 hours of rest in any 24-hour period.

(b) The hours of rest required under paragraph (a) of this section may be divided into no more than two periods, of which one must be at least 6 hours in length.

(c) The requirements of paragraphs (a) and (b) of this section need not be maintained in the case of an emergency or drill or in other overriding operational conditions.

(d) The minimum period of 10 hours of rest required under paragraph (a) of this section may be reduced to not less than 6 consecutive hours as long as—

(1) No reduction extends beyond 2 days; and

(2) Not less than 70 hours of rest are provided each 7-day period.

(e) The minimum period of rest required under paragraph (a) of this section may not be devoted to watchkeeping or other duties.

§ 15.705 Watches.

(a) Title 46 U.S.C. 8104 is the law applicable to the establishment of watches aboard certain U.S. vessels. The establishment of adequate watches is the responsibility of the vessel's master. The Coast Guard interprets the term *watch* to be the direct performance of vessel operations, whether deck or engine, where such operations would routinely be controlled and performed in a scheduled and fixed rotation. The performance of maintenance or work necessary to the vessel's safe operation on a daily basis does not in itself constitute the establishment of a watch. The minimal safe manning levels specified in a vessel's certificate of inspection takes into consideration routine maintenance requirements and ability of the crew to perform all operational evolutions, including emergencies, as well as those functions which may be assigned to persons in watches.

(b) Subject to exceptions, 46 U.S.C. 8104 requires that when a master of a seagoing vessel of more than 100 gross tons establishes watches for the licensed individuals, sailors, coal passers, firemen, oilers and watertenders, the personnel shall be *divided, when at sea, into at least three watches and shall be kept on duty successively to perform ordinary work incident to the operation and management of the vessel.* The Coast Guard interprets *sailors* to mean those members of the deck department other than licensed officers, whose duties involve the mechanics of conducting the ship on its voyage, such as helmsman (wheelsman), lookout, etc., and which are necessary to the maintenance of a continuous watch. *Sailors* is not interpreted to include able seamen and ordinary seamen not performing these duties.

(c) Subject to exceptions, 46 U.S.C. 8104(g) permits the licensed individuals and crew members (except the coal passers, firemen, oilers, and watertenders) to be divided into two watches when at sea and engaged on a voyage of less than 600 miles on the following categories of vessels:

(1) Towing vessel;

(2) Offshore supply vessel; or,

(3) Barge.

(d) Subject to exceptions, 46 U.S.C. 8104(h) permits a licensed individual operating an uninspected towing vessel that is at least 26 feet in length measured from end to end over the deck (excluding sheer) to work not more than 12 hours in a consecutive 24 hour period except in an emergency. The Coast Guard interprets this, in conjunction with other provisions of the law, to permit licensed individuals serving as operators of uninspected towing vessels that are not subject to the provisions of the Officers' Competency Certificates Convention, 1936, to be divided into two watches regardless of the length of the voyage.

(e) Fish processing vessels are subject to various provisions of 46 U.S.C. 8104 concerning watches.

(1) For fish processing vessels that entered into service before January 1, 1988, the following watch requirements apply to the licensed officers and deck crew:

(i) If over 5000 gross tons—three watches.

(ii) If more than 1600 gross tons and not more than 5000 gross tons—two watches.

(iii) If not more than 1600 gross tons—no watch division specified.

(2) For fish Processing vessels which enter into service after December 31, 1987, the following watch requirements apply to the licensed officers and deck crew:

(i) If over 5000 gross tons—three watches.

(ii) If not more than 5000 gross tons and having more than 16 individuals on board primarily employed in the preparation of fish or fish products—two watches.

(iii) If not more than 5000 gross tons and having not more than 16 individuals on board primarily employed in the preparation of fish or fish products—no watch division specified.

§ 15.710 Working hours.

In addition to prescribing watch requirements, 46 U.S.C. 8104 sets limitations on the working hours of licensed individuals and crew members, prescribes certain rest periods, and prohibits unnecessary work on Sundays and certain holidays when the vessel is in a safe harbor. It is the responsibility of the master or person in charge to ensure that these limitations are met.

APPENDIX 4

NAVO/UNOLS Data Collection Metrics

- **Gravity task**
  - UNOLS completed 25% of requirement FY 97
  - FY 98 UNOLS scheduled for 58% of priority requirement
  - FY 99 scheduled shiptime completes all areas possible
    - EEZs prohibits UNOLS from fulfilling total gravity requirement
- **Physical Oceanography observations** (processed data to date)
  - Cores 150
    - Grabs 92
  - CTD's 3517
  - XBT's 1421
- **FLEET training areas**
  - Upgraded bathymetry and hydrophone placement requirement
    - Shallow and deep water requirement at (AUTEC)
  - Completed all Southern California (SCORE) range geophysical sampling

UNOLS 98 Operations

CAPE HELOPEN	**42 Days**	**Physical Oceanography**
CAPE HATTERAS	**56 Days**	
WECOMA	**15 Days**	
PELICAN	**24 Days**	
REVELLE	**135 Days**	**Gravity Survey**
THOMPSON	**60 Days**	**Gravity/Physical Oceanography**
KNORR	**19 Days**	**AUTEC Range update**
NEW HORIZON	**80 Days**	**SCORE Range update**

UNOLS 99 Operations

CAPE HELOPEN	**37 Days**	**Physical Oceanography**
CAPE HATTERAS	**56 Days**	
PELICAN	**45 Days**	
PT SUR	**34 Days**	
THOMPSON	**41 Days**	
REVELLE	**145 Days**	**Gravity Survey**
NEW HORIZON	**60 Days**	**SCORE Range update**
MELVILLE	**42 Days**	**Hull Integrity test site**

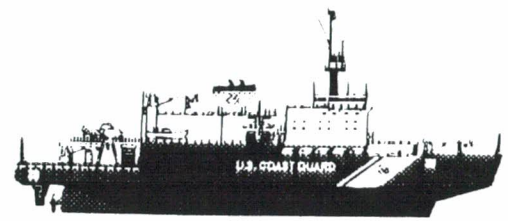
Scheduling and cost comparisons

1998		1999	
Ship days	**431**	**Ship days**	**460**
Funds	**7.5M**	**Funds**	**7.5M**
↳Ships	6.6M	↳Ships	6.4M
↳Other	0.9M	↳Other	1.1M
UNOLS Institutions	**7**	**UNOLS Institutions**	**7**
Ships Used	**8**	**Ships Used**	**8**

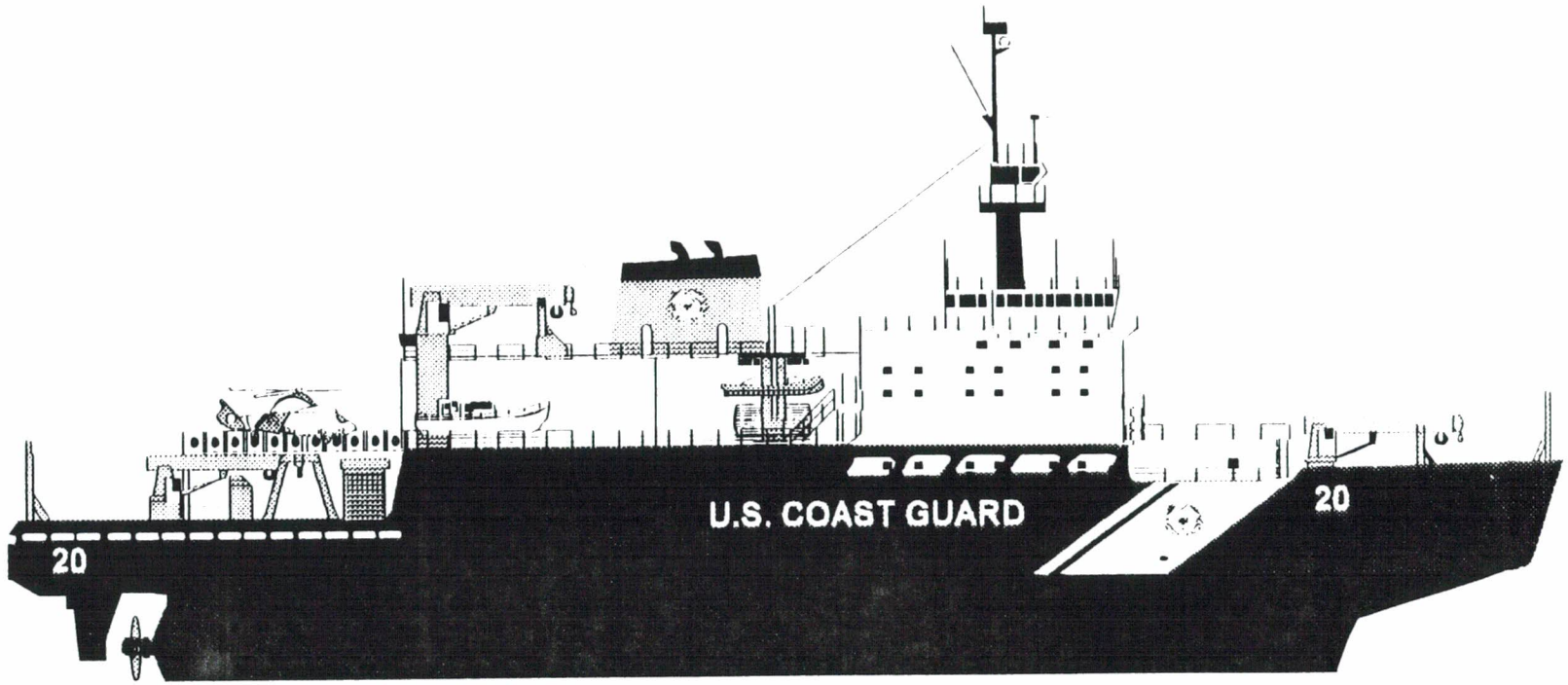
APPENDIX 5

POLAR ICEBREAKER (WAGB-20)
Mission Description

- USCGC HEALY's primary mission will be to function as a world class high latitude research platform.
- The HEALY will be capable of being employed in Arctic icebreaking operations during all seasons. All ship systems are designed to function for extended winter operations, including intentional wintering over.
- Secondary missions include ice escort to supply vessels supporting Arctic installations and bases, search and rescue, and marine environmental protection response.



POLAR ICEBREAKER
USCGC HEALY (WAGB-20)



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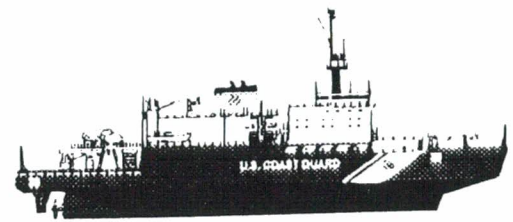
POLAR ICEBREAKER (WAGB-20)
Command and Control

- Ship Control from Five Conning Stations
  - Bridge: Main Ship Control Console, Port & Starboard
  - Aloft Conning Station
  - Science Conning Station
- Centralized Locations for All Informaion

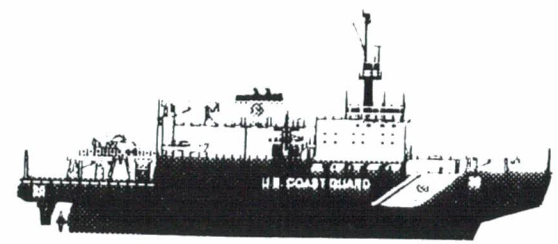
POLAR ICEBREAKER (WAGB-20)
Ship Characteristics

• Length *(Overall)*	420’
• Beam *(Extreme)*	82’
• Draft *(Full Load)*	29’ (Max)
• Displacement *(Full Load)*	16,385 Tons
• Shaft Horse Power	30,000 SHP
• Icebreaking	4.5FT at 3 KT
• Crew Size	67 Crew, 8 Avdet
	35 Scientists, 15 Surge



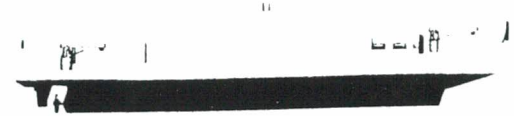
WAGB-20 SHIP CONTROL SYSTEMS

- FIXED PITCH PROPELLERS
- TWIN RUDDERS
- BOW THRUSTER
- BOW WASH SYSTEM
- ANTI-ROLL STABILIZATION TANK



POLAR ICEBREAKER (WAGB-20)
Integrated Bridge System

- Sperry Marine Voyage Management System (VMS)
  - Seven Pentium-Based Windows NT Systems Linked via Ethernet
  - Two Fully Functional ECDIS Systems with Radar Overlay
- Sperry Marine Rascar Radars
  - Complete Independent X and S Band Systems
- Science Data Network Monitors
  - Preset Monitor to Display Any Information Available on SDN



POLAR ICEBREAKER (WAGB-20)
Integrated Bridge System *(continued)*

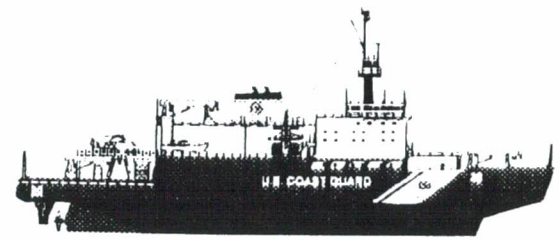
- Closed Circuit TV Monitors
- External and Internal Communications
- Cegelec Dynamic Positioning System (DPS)
  - Auto-Pilot and Auto-Positioning System
  - Critical Link between ECDIS and MPCMS
- Dual Sperry Marine Mark-37 Gyrocompasses
- MPCMS Control Terminal and Displays

POLAR ICEBREAKER (WAGB-20)
Propulsion Package

- Cegelec Projects Ltd is Single Source Vendor for Propulsion System
- Diesel Electric 6600V AC/AC Cycloconverter Plant Driving Two AC Synchronous 11.2MW Main Motors
- Twin Shafts with Fixed Pitch Propellers
- Twin Rudders
- 2200 HP Bow Thruster

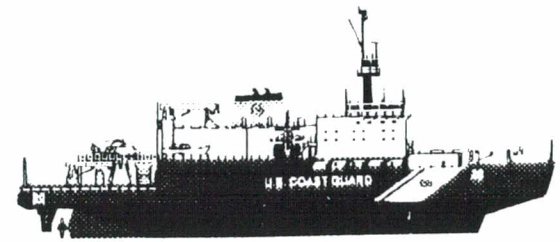
SCIENCE DATA NETWORK

- Real time data acquisition network
- Dual Independent Fiber Distributed Data Interface (FDDI) LAN System
- Continuous Sensor Validation and Data Recording
- Display and Process Scientific and Navigational Data
- Fiber to desktop, 120 Ethernet ports
- INMARSAT and Electronic Mail capability
- Windows NT Operating System
- State of the market software and hardware at delivery.



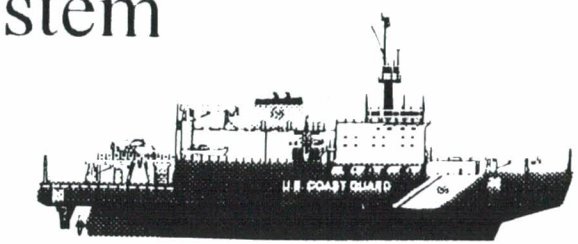
DATA ACQUISITION

- Acoustic Doppler Current Profiler
- Ambient Air Temperature Sensor
- Bathymetric Survey System
- Expendable Bathythermograph System
- Climate Control Chamber Sensors
- CTD Sampling System
- Depth Recorder System
- TDP GPS
- Gyro compass



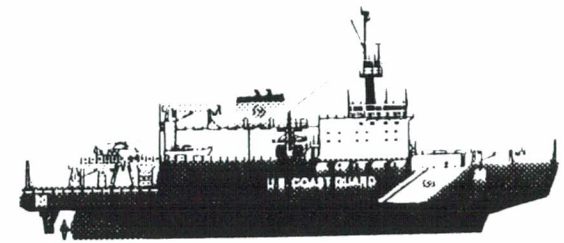
DATA ACQUISITION

- GPS / LORAN-C
- Science Winch Data Systems
- Uncontaminated Seawater System Temperature
- Salinometer
- Field Fluorometer
- Ship Motion Sensor
- Underwater Log System
- Wind Speed and Direction System
- Multi-Beam Survey System



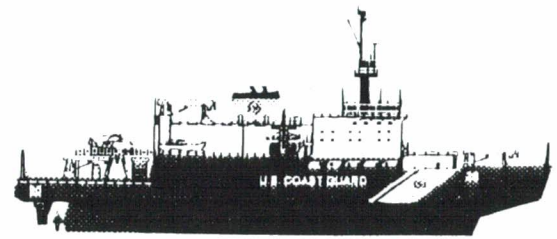
WINCH AND CRANE SYSTEMS

- Winches: Coring/Trawl, Oceanographic
- Stern A-Frame
- Starboard A-Frame
- Cranes: 5 hydraulic - cover all work decks.
- Hoists, Lifts and Trolleys



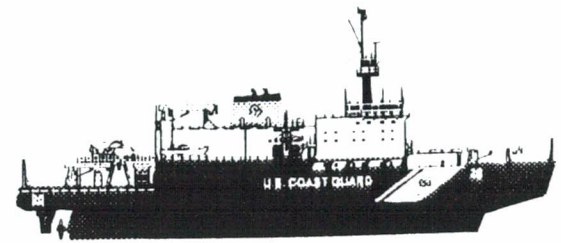
SCIENCE SUPPORT SYSTEMS

- Science vans (10)
- Bow boom and tower
- Cargo holds
- Science Communications Center
- TeraScan Satellite Receiver



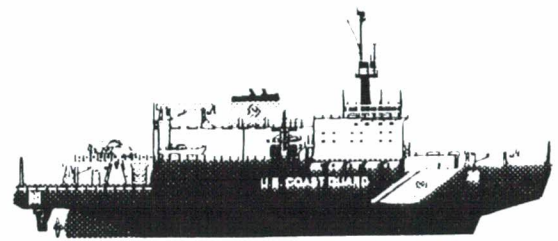
SCIENCE OPERATIONS

- Quiet ship operations
- Accessible SONAR transducers
- No overboard discharge up to 24 hours
- Core lengths up to 30 meters
- Modified shipboard and flight operations



SCIENCE SUPPORT SYSTEMS

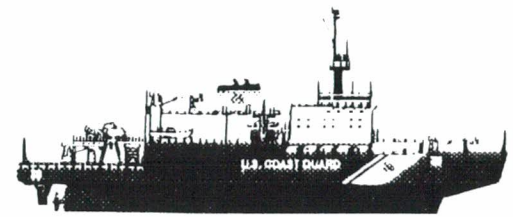
- Aircraft: HH-65 Dauphin (2)
- Boats
  - Arctic Survey Boat (ASB)
  - Landing Craft (LCVP)
  - Rigid Hull Inflatables (RHI)
- Dive team: U.S. Navy standards and procedures



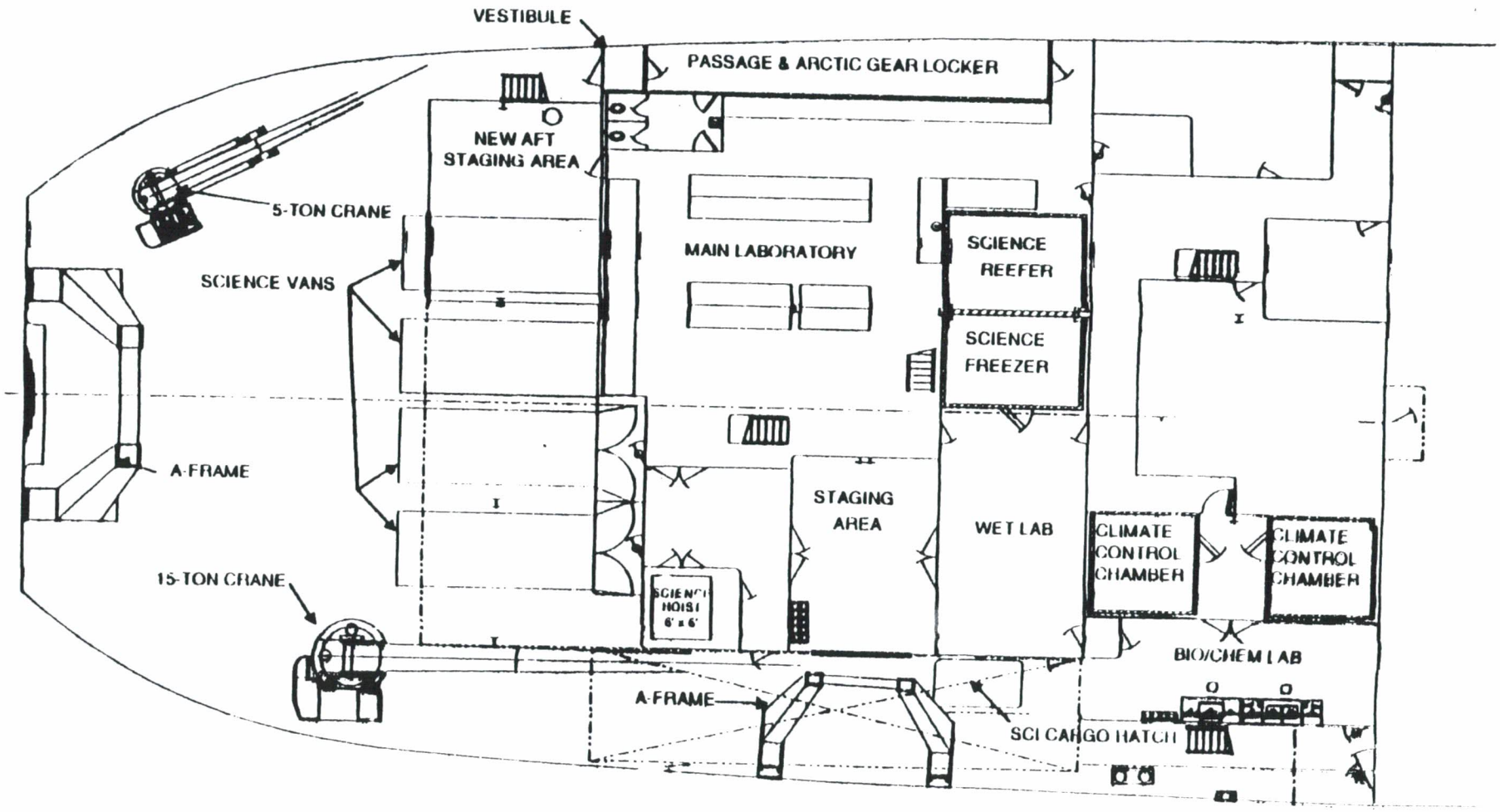
POLAR ICEBREAKER (WAGB-20)
Science Labs

Science Wet Lab	390 sq ft
Main Science Lab	1233 sq ft
Science Staging Area (Bay)	325 sq ft
Science Dry Assembly Area	153 sq ft
Biological/Chemical Analysis Lab	310 sq ft
Science Freezer	266 sq ft
Science Refrigerator	169 sq ft
Climate Controlled Chambers	206 sq ft
Electronics/Computer Lab	528 sq ft
Photography Lab	105 sq ft
Future Science Lab	546 sq ft
Meteorological Lab	64 sq ft

Labs and Climate Control Chambers Provided with Deck Sockets, Unistrut System, and Clean Electrical Power.

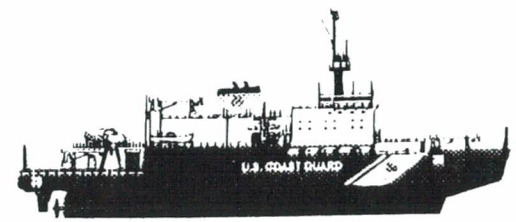


Improved Science Arrangement



POLAR ICEBREAKER (WAGB-20)
Science Winches and Cranes

- Two oceanographic winches, capable of handling 10,000 meters of 3/8" wire, 12,000 meters of 0.322" electro-mechanical cable, or 14,000 meters of 1/4" wire.
- One double drum trawl/core winch, capable of handling 10,000 meters of 3/4" wire, 12,000 meters of 0.680" electro-mechanical cable, or 14,000 meters of 9/16" wire.
- Five hydraulically operated cranes providing 100% coverage of working decks.



POLAR ICEBREAKER (WAGB-20)
Other Science Systems

- **Dedicated Science Communications Center** - INMARSAT system containing voice and high speed data transmission, GMDSS & OMNET capability, interface with Science Data Network (SDN).
- **Staging Area for Science Operations** - Provided with a bridge crane and hoist, roller door access with freeze curtain to weather deck, direct access to wet lab, science conning stations and holds.
- **Vans** - Six standard ISO vans with service hookups (including electrical, HVAC, air, science data network, and uncontaminated seawater), two 40' vans for storage (when ASB & LCVP not embarked), and two standard ISO vans for storage.

APPENDIX 6

CHARTERING OUT

Pitfalls encountered dependent on charterer and type of research:

1. Scientific organization
   a. own research
   b. commercial research
2. Commercial organization — commercial research

Case 1.a. Stick to your own regime as to planning/regulations onboard etc.
Use a standard C/P recognized in the shipping world (BIMCO)
As to liabilities use a form of mutual indemnity and waiver of recourse

Case 1.b.: inevitably give way as to planning procedures etc.
try to stick to your standard C/P as much as possible

Case 2: **be prepared for:**

uncertainty as to planning	late confirmation
	extension option
tough contract negotiations	too many parties involved
excessive requirements	insurance
	liabilities, especially 3rd party liabilities
	indemnities and warranties
	Y2000 compatibility
	confidentiality
	cancellation and/or off-hire rights
	safety and health regulations
	emergency response action plan
	offshore (oil field) survey practices
	Greenpeace activities

Pitfalls:

Planning: last minute rescheduling ⇒ frustrated scientists/technicians
extension option ⇒ always set a fixed date and time that the vessel must be redelivered!!

Negotiations: - always make clear from the beginning that you are a scientific organization ⇒ other rules prevail than in the commercial world!
- set a penalty clause for late payment (big consortia)
- avoid subcontractorship (rider clauses!)
- stick to your standard C/P that is supported by your insurer
- evaluate the use of a simple Data Exchange Contract

Insurance and liabilities: - always consult your insurance broker and/or your P&I insurer
- never sign a contract that contains issues you cannot live-up to or that you do not understand completely

Safety and Health Regulations

Offshore (oil field) survey practices:

if the science performed does not deviate from your usual practice: stick to your prevailing rules and regulations and scientific survey practices.

Emergency Response Action Plan:

the Greenpeace phantom can have a serious impact!

Oil consortia

a case: a consortium of 17 oil companies

the consortium secretariat

the project-organisation

the representing oil company (license holder)

the Government of the country that gives financial support and grants the licenses/clearances

the technical agency

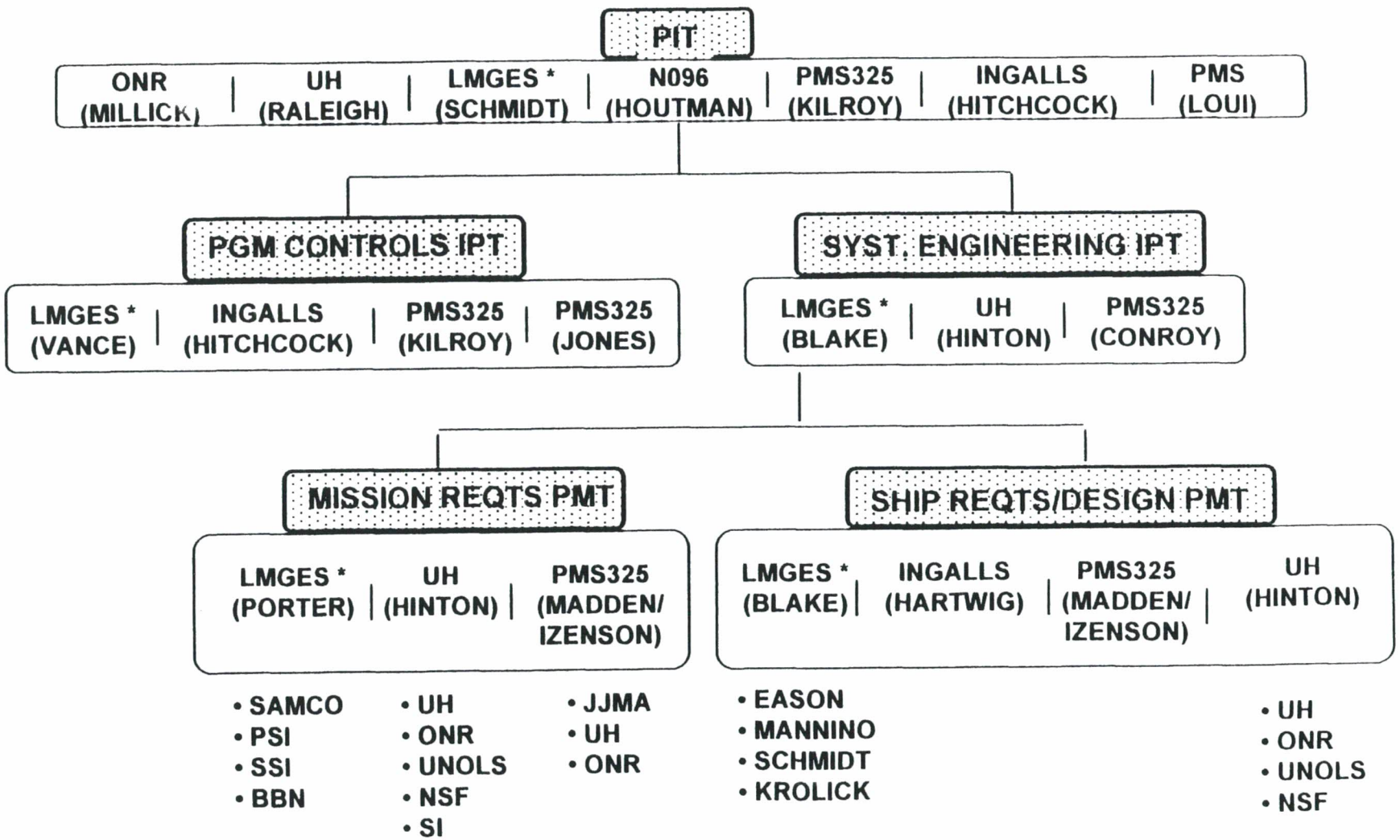
the scientific group (university)

the ship owner (NIOZ)

APPENDIX 7

SWATH AGOR 26

PRESENTATION TO RVOC
STATUS AS OF 11/04/98


PIT
ONR (MILLICK)
UH (RALEIGH)
LMGES * (SCHMIDT)
N096 (HOUTMAN)
PMS325 (KILROY)
INGALLS (HITCHCOCK)
PMS (LOUI)
PGM CONTROLS IPT
LMGES * (VANCE)
INGALLS (HITCHCOCK)
PMS325 (KILROY)
PMS325 (JONES)
SYST. ENGINEERING IPT
LMGES * (BLAKE)
UH (HINTON)
PMS325 (CONROY)
MISSION REQTS PMT
LMGES * (PORTER)
UH (HINTON)
PMS325 (MADDEN/ IZENSON)
• SAMCO
• PSI
• SSI
• BBN
• UH
• ONR
• UNOLS
• NSF
• SI
• JJMA
• UH
• ONR
SHIP REQTS/DESIGN PMT
LMGES * (BLAKE)
INGALLS (HARTWIG)
PMS325 (MADDEN/ IZENSON)
UH (HINTON)
• EASON
• MANNINO
• SCHMIDT
• KROLICK
• UH
• ONR
• UNOLS
• NSF

OPERATIONAL CAPABILITIES

- **OVERVIEW**

- SWATH AGOR is to be a fully-equipped, small waterplane area, twin hull (SWATH) oceanographic research ship. This document provides a brief description of the desired capabilities of the ship. The primary goal of the SWATH AGOR is to extend the limited capability of monohulls for performing oceanographic operations in high sea states. It should be emphasized that these capabilities are not firm requirements and should be treated as goals. As the project progresses, required capabilities will be adjusted if it becomes apparent that some capabilities are not affordable. The Government will work with the industry team to determine acceptable requirement values. This document is not intended to convey all the information required to complete the design of the ship.

- **GENERAL CAPABILITIES**

- The mission of the SWATH AGOR will be to conduct general purpose oceanographic research in coastal and deep ocean areas. The ship should be capable of performing the following tasks:

  - a. Sampling and data collection of surface, midwater and sea floor parameters using modern scientific instrumentation
  - b. Launch, towing, and recovery of scientific packages, both tethered and autonomous, including the handling, monitoring and servicing of remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), and boats
  - c. Shipboard data processing and sample analyses in modern, well-equipped scientific laboratories
  - d. Precise navigation and station keeping and track-line maneuvering to support deep sea and coastal operations
  - e. Long periods of operation at low speeds.

SPECIFIC CAPABILITIES

The following specific capabilities are desired and are presented in order of priority. Although highly desired, these capabilities are not firm requirements and should be treated as goals.

a. Performance in a Seaway: Fully operational in sea state 6 (4 to 6 meter wave height; 28 to 47 knot wind) at all headings
b. Exterior Working Deck Area: 2,000 square feet of contiguous, exterior working deck area
c. Station Keeping Capability: +/- 50 meters in sea state 6
d. Science Payload: Capacity for 100 tons of temporary science equipment brought on board for specific missions and stored on deck and in storerooms.
e. Length/Beam/Draft Limitations: Ability to reduce draft to less than 17 feet for pier access in a light load condition. Ability to transit through the Panama Canal.
f. Laboratory Area: Total of 3,000 square feet divided among multiple labs and located adjacent to the working deck
g. Science Staff: 25 scientists and technicians in addition to the crew required to operate the ship.
h. Speed: 15 knots
i. Endurance: 50 days at sea.
j. Range: 10,000 nautical miles
k. Scientific Gear Storage Space :15,000 cubic feet in below deck storerooms

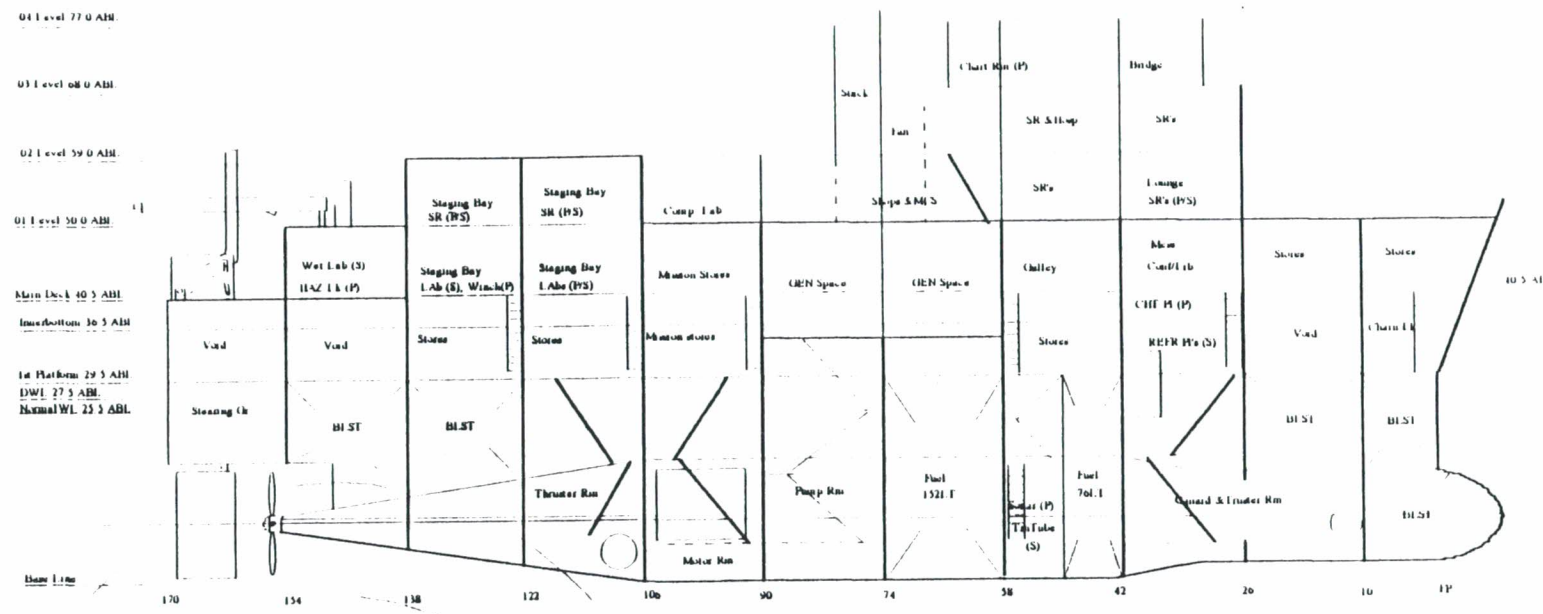
					Ship equipment used																										
Ship/yr	Days/ Trans	Av. Spd.	Cruise type	Sci. Party	DP	#1ctd w inch	#2ctd w inch	SEA BEAM	3.5 Khz	12 Khz	Hydro- Boom	A-Frame	w ire	9/16	Deck Crane	0.68 Cable	ADCP	IMET	ADF	Refrig/ Freez.	Seismic Comp.	UPS Pow er	Sea Water	SIS	Inst Well	Grav Meter	deck Serv.				
K 97	28	12+	Weather	23		x			x		x				x		x	x					x	x	x		x				
K 97	49	8+	PhysO	30		x		x	x		x	x	x		x		x			x			x	x	x		x				
K 97	10	<8	Mooring	20	x			x	x	x		x	x		x		x						x	x	x		x				
K 97	21	<8	Net Tow			x			x			x					x						x				x				
K 97	9	>12	Transit	0				x	x	x						x	x			x			x	x	x		x				
K 97	38	<10	WOCE line	30		x	x	x	x		x	x	x		x	x	x	x	x	x			x	x	x		x				
K 97	29	<10	WOCE line	30		x	x	x	x		x	x	x		x	x	x	x	x	x			x	x	x		x				
K 97	22	<10	WOCE line	30		x	x	x	x		x	x	x		x	x	x	x	x	x			x	x	x		x				
K 97	9	>12	Transit	0				x	x	x						x	x			x			x	x	x		x				
K 97	38	<10	WOCE line	30		x	x	x	x		x	x	x		x	x	x	x	x	x			x	x	x		x				
K 97	3	<8	Mooring	3	x			x	x	x		x	x		x	x	x	x	x	x			x	x	x		x				
K 97	26	>12	Sea map	20				x	x	x							x						x				x				
K98	31/8	<10	Mooring	20	x	x		x		x	x	x	x		x		x						x	x							
K98	6	>12	Transit	0				x	x	x							x	x	x				x	x	x		x				
K98	14	>10	survey	15		x		x	x		x	x	x		x		x						x								
K98	6	>12	Transit	0				x	x	x							x			x			x		x		x				
K98	16	<8	RMV sup.	15	x										x																
K98	29	<8	Coring	25	x	x		x	x	x	x	x	x		x		x			x			x	x	x		x				
K98	15	<8	Mooring &F	25	x	x		x	x	x	x	x			x		x		x								x				
K98	9	>12	Transit	0				x	x	x							x						x	x	x		x				
K98	26	<8	Gnt coring	30	x	x		x	x	x	x	x	x		x		x			x			x	x	x		x				
K98	25	>12	Transit	0				x	x	x							x						x	x	x		x				
K98	35	<8	Gnt coring	30	x	x		x	x	x	x	x	x		x		x			x			x	x	x		x				
K98	6	>12	Transit	0				x	x	x							x						x	x	x		x				
K98	33	<10	Chemistry	30		x	x	x	x		x	x	x		x	x	x	x	x	x			x	x	x		x				
K98	11	>12	Transit	0				x	x	x							x						x	x	x		x				
T96	17	<10	Sedim traps	10		x			x		x	x			x	x	x														
T96	9	>12	Transit	2				x	x								x							x	x						
T96	44	<10	CTD,SCS	28	x	x	x	x	x	x	x	x	x		x	x	x														
T96	20	>12	Trqnsit	2				x	x								x			x	x			x	x		x				
T96	9	>12	Transit	2				x	x								x														
T96	35	<10	CTD,Recov.	29	x	x		x	x	x	x	x	x		x	x	x														
T96	49	<10	OBS recov.	24	x	x		x	x	x	x	x	x		x	x	x	x	x	x			x	x	x		x				
T96	15	<10	CTD,Stud.	34	x	x		x	x	x	x				x		x						x	x	x		x				
T96	21	<8	ROV	35	x	x		x	x	x	x				x		x							x	x						
																	x						x	x	x		x				

Mission Description

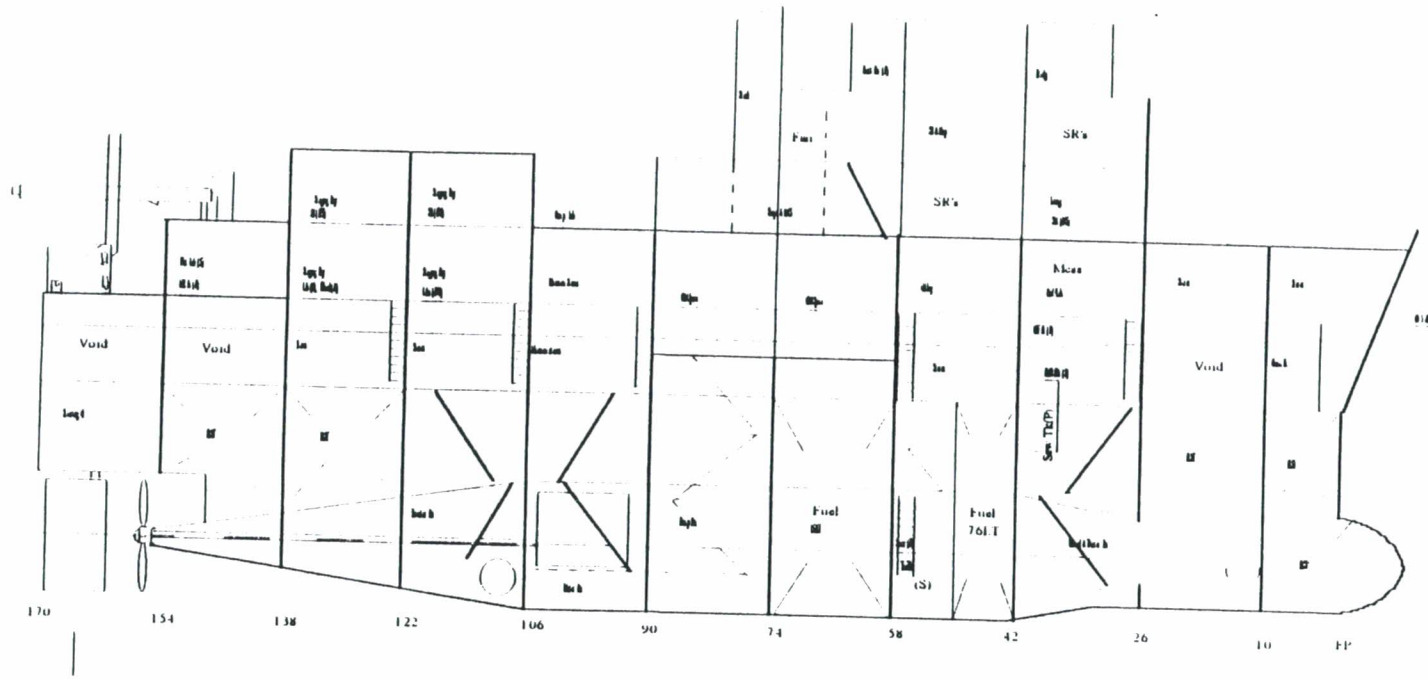
Mission Description	Low Spd Kts	Low Spd Days	Med Spd Kts	Med Spd Days	High Spd Kts	High Spd Days	Total Mission Days	Total Range NM	No. of Crew	No. of Pass	Portable Payload Required LT	Reserve Payload Available LT	Total Portable Payload LT
• HOT quarterly cruise with mooring	1	5	8	8	13	1	14	1968	16	25	17	83	100
• Bottom Observatory Service w/ ROV	0	4	6	1.3	13	6.7	12	2278	16	25	10	90	100
• Sidescan, seismics & sampling	1.5	3	8.2	21.3	13	3.7	28	5454	16	30	36	64	100
• Ocean bottom seismics	2	9	6	7	13	10	26	4560	16	25	28	72	100
• Biogeochemistry Flux Studies	0	14	8	11	13	7	32	4296	16	32	25	75	100
• Physical Oceanography	1	16	0	0	13	14	30	4752	16	24	25	75	100
• CTD, nets, moorings	1	10	10	12	13	8	30	5616	16	28	31	69	100
• Survey & Dredge	2	15	0	0	13	15	30	5400	16	25	25	75	100
• Air-sea Atmospheric Geochemistry	0	1	0	0	13	25	26	7800	16	28	10	90	100
• Trace Element Geochemistry	0	9	0	0	13	25	34	7800	16	28	31	69	100
• Marine Geophysics Survey	0	0	0	0	13	30	30	9360	16	25	24	76	100

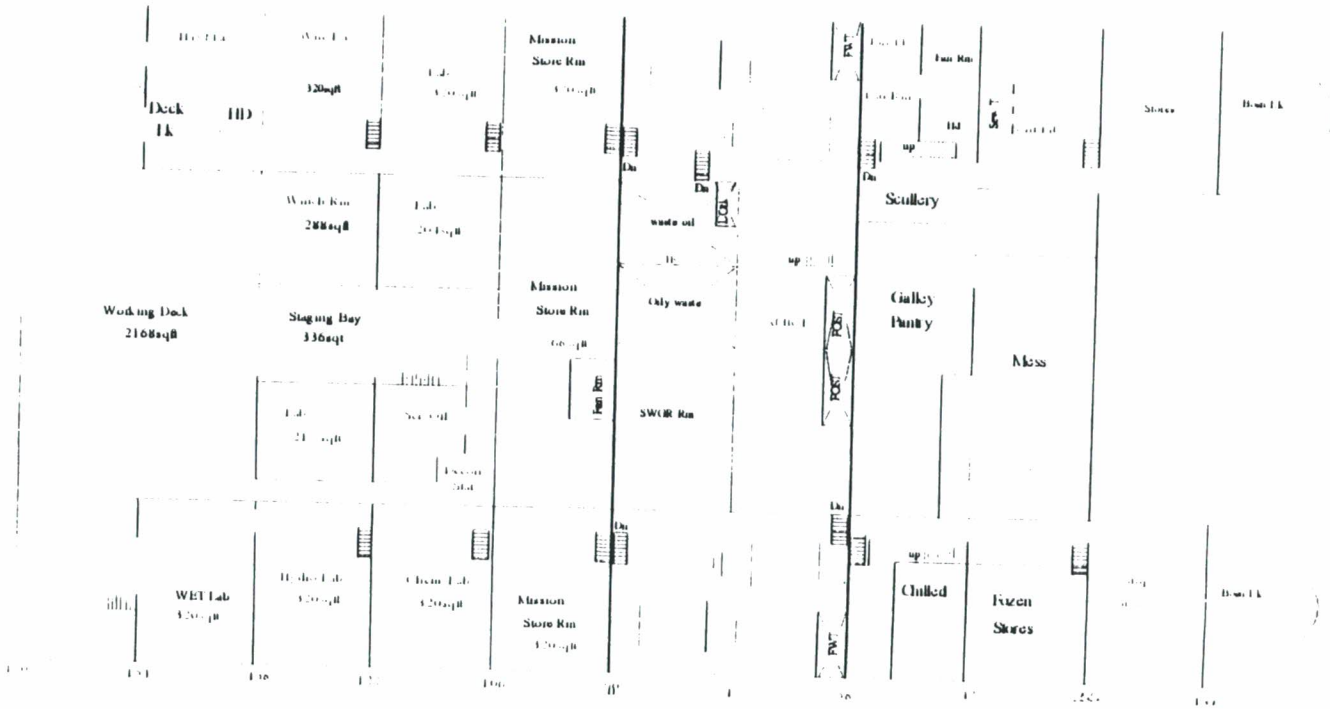
Assumes a 100 LT portable payload for all missions per DOC. Portable payload consists of identified mission unique equipment that are not permanently built into the ship. Balance of 100 LT payload is held in reserve.

Item	Space ft.	Weight #	Removable	Installed	Provided	Power req.	ROM (k$)	Location~	% used
CTD									
Winch DESH5	8x8	15000		yes	LM	75hp		aft deck	
2nd winch	8x8	15000	yes		UoH	50hp		aft deck	foundtion and serv. Connection
.322 em cable		2821	yes		UNOLS			aft deck	10000m
Handing sys.		15800		yes	LM	50hp		aft deck	Hydro Boom
Rosett	7h x4d	2500	yes		UoH			aft deck	
.25 wire		3609	yes		UNOLS			aft deck	10000m
Sonars									
Multib. Found.	~15x20			yes	LM				Foundation/cable way/space
Multib. Sys				yes	LM				
3.5Khz	2x2			yes	LM				
12Khz	2x2			yes	LM				
ADCP	2x2			yes	LM				
Vert. Ref. Sys.	1x1			yes	LM				
Dop. Sp. Log	1x1			yes	LM				
Instri. Well	30"D			yes	LM				
Main winch									
DESH9/11	10x15x8h	58000		yes	LM	150hp		winch rm	for coring/dredge/nets
9/19 wire		32900	yes		UNOLS				9/16wire & 680 cable
.680 cable		32800	yes		UNOLS				
A-frame	20x10x22h	32000		yes	LM			aft deck	
A-frame power	3x6	2150		yes	LM	75hp		winch rm	hydro power pack
Side A-frame	12x8x12h	15000		yes	LM			aft side	
Imet tower	8x8			yes	LM			Forward deck	Foundation/services
Traction winch	~5x8	~25900		yes	LM	50HP		winch rm	replace DESH9/11
Uncont.sea W	2" serv.			yes	LM	1hp		Labs/aft deck	
Sci Fef/Frez	10x10		yes		UoH			aft deck	Power service for 8x20 iso van
Seismic sys	10x20	25000		yes	LM	2x150HP		below decks	LM provide fn/power
Tie downs				yes	LM			deck/labs	Working deck 1"&labs3/8"
Unistrut				yes	LM			Labs	2' centers
Sci wireway				yes	LM				Labs/for&aft deck/bridge&mast
SIS				yes	LM			rm's/labs/decks/br/sonar space	
SATCOM M	2x2	200		yes	LM				
P-code GPS		5	yes		UoH				
Gravimeter	3x3	300	yes		UoH				
Magnetometer	3x3	300	yes		UoH				



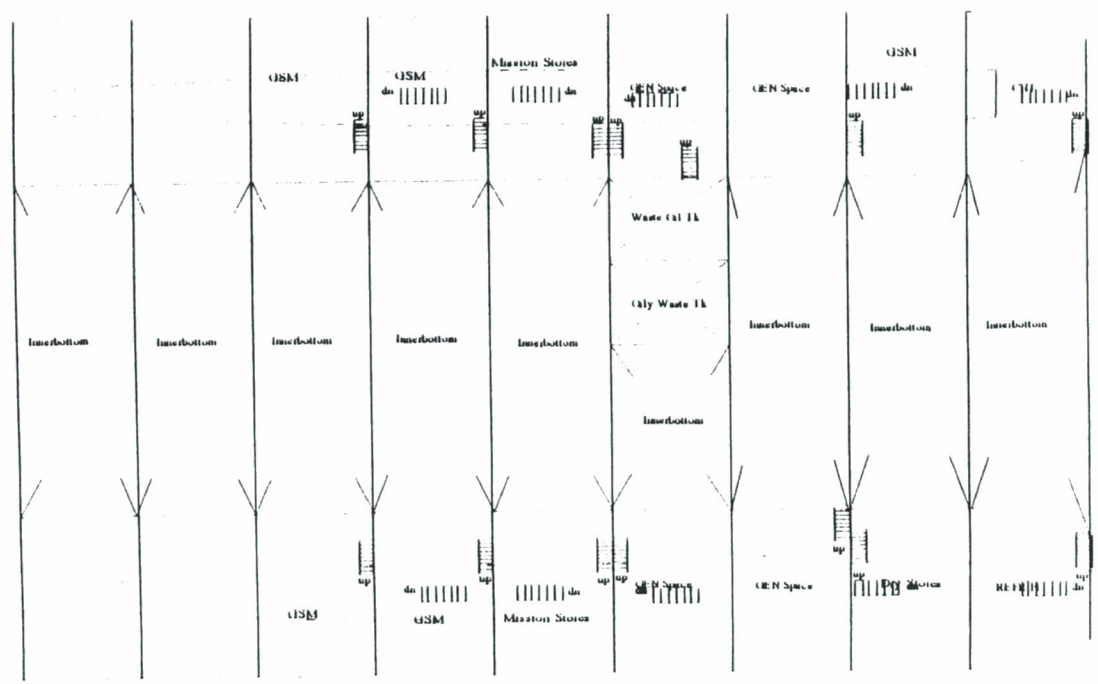
SWATH AGOR
NOTIONAL
CONCEPT LAYOUT
DISPLACEMENT 2500 LT

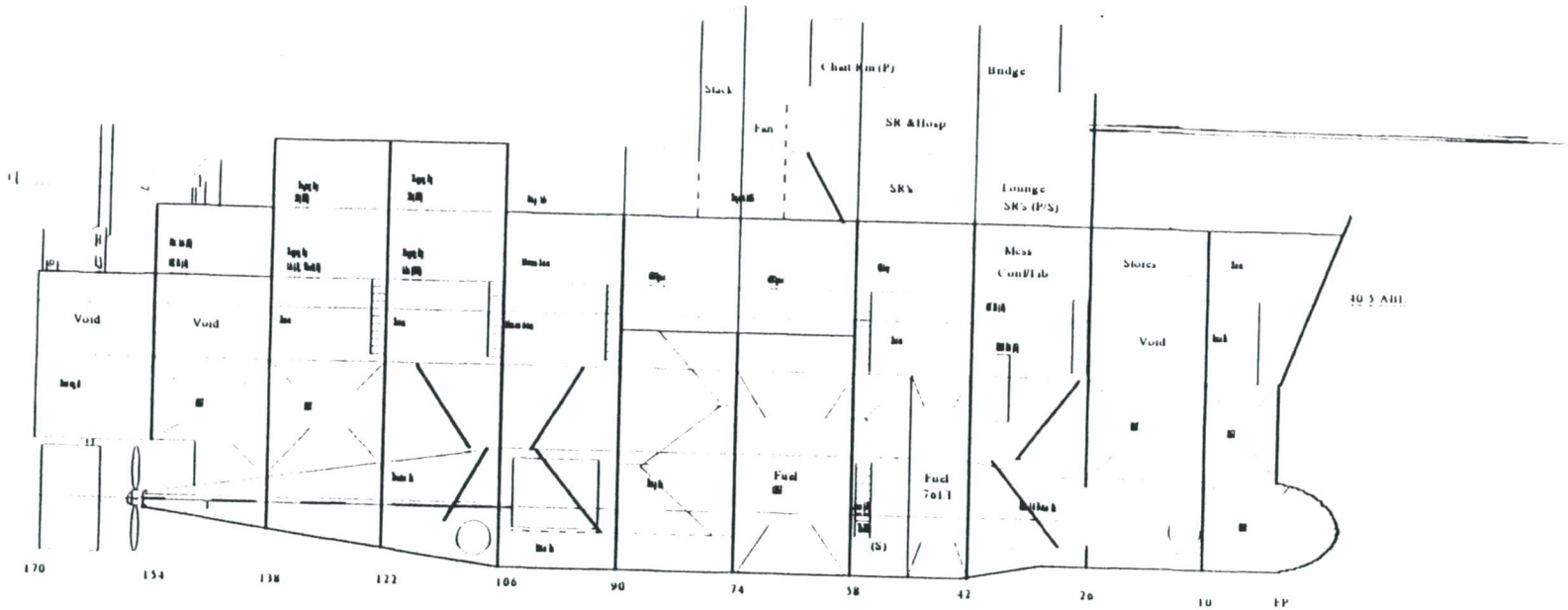


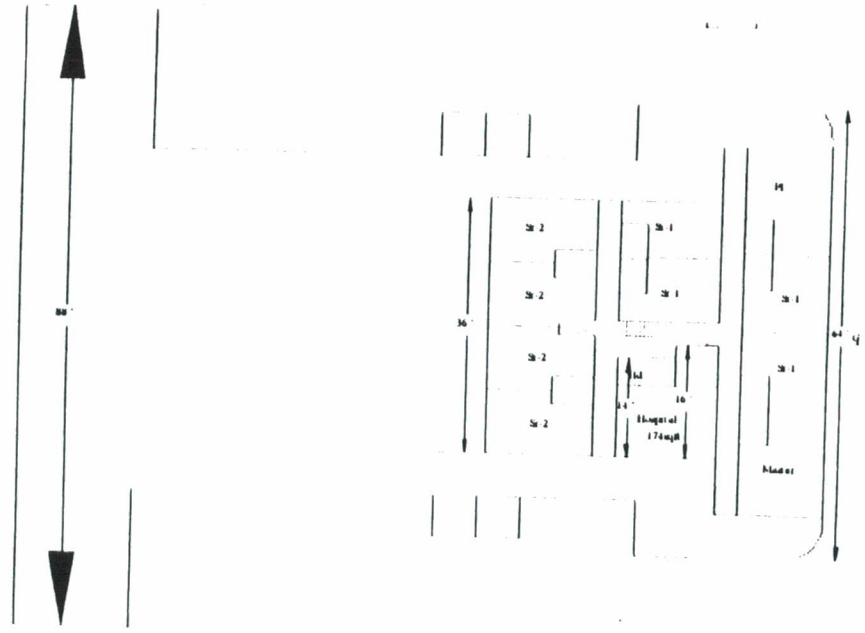


SWATH AGOR
NOTIONAL
CONCEPT LAYOUT
DISPLACEMENT 2500LT

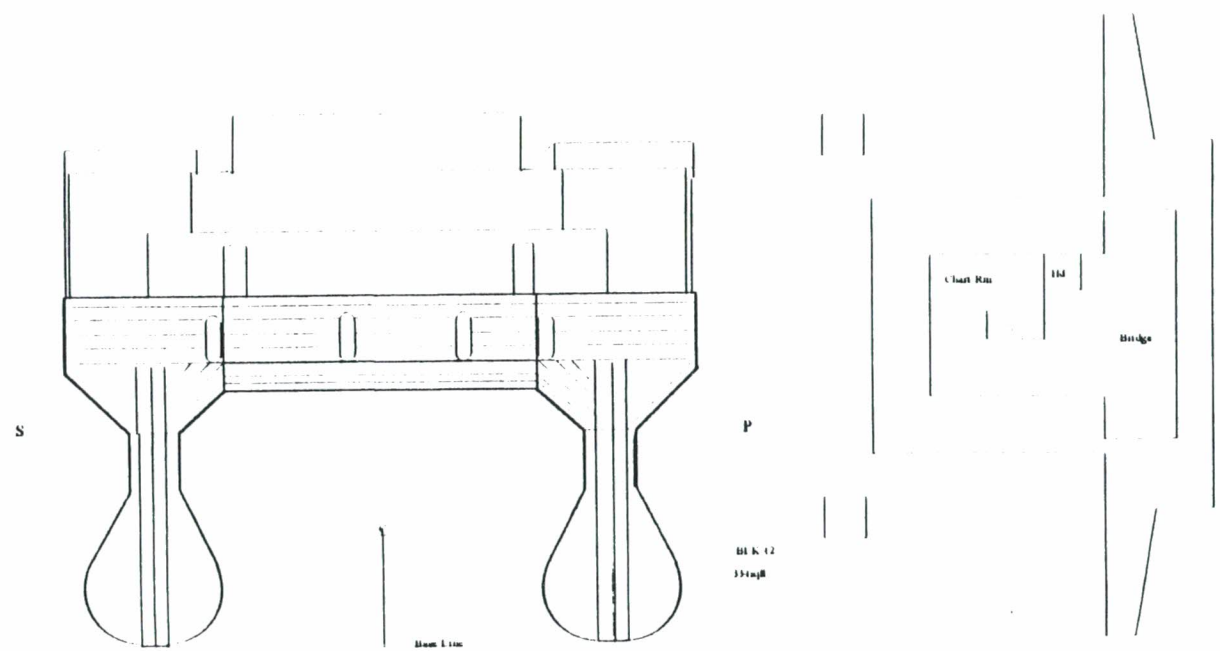

Void
Void
Fuel
Fuel
Void
SR's
SR's
Mess
(S)
170
154
138
122
106
90
74
58
42
26
10
FP


GSM
GSM
Mission Stores
GEN Space
GEN Space
GSM
Waste Oil Tk
Oily Waste Tk
Innerbottom
Innerbottom
Innerbottom
Innerbottom
Innerbottom
Innerbottom
Innerbottom
Innerbottom
Innerbottom
GSM
GSM
Mission Stores
GEN Space
GEN Space





SWATH AGOR
NOTIONAL
CONCEPT LAYOUT
DISPLACEMENT 2500 LT
28 Sept 98 Scale 1/500



SWATH AGOR
NOTIONAL
CONCEPT LAYOUT
DISPLACEMENT 2500 LT
28 Sept 98 Scale 1/500

COST

PHASE TWO 36,000K

INGALLS 52,000K

Yard Package

- Weight Report
- General Arrangement Drawings
- Mid-ship section
- Hull lines
- EPLA
- One line electrical Schematic
- Information system block diagram
- Propoltion drive and thruster sizing
- Stability, powering, fuel comp/endurance, seakeeping
- Machinery arrangement
- Master equipment list
- Auxiliary system calculation
- Ballast calculation
- Model test plan
- Ship secification

SCHEDULE

- 2 Oct: Receive ROM alternate yards
- 7-8 Oct: review ROM by IPT
- 6 Nov: Release RFP to yards
- 8-9 Dec: IPT review and select yard
- 11 Dec: announce award to complete phase 1
- TBD(Jan): Design Review #2

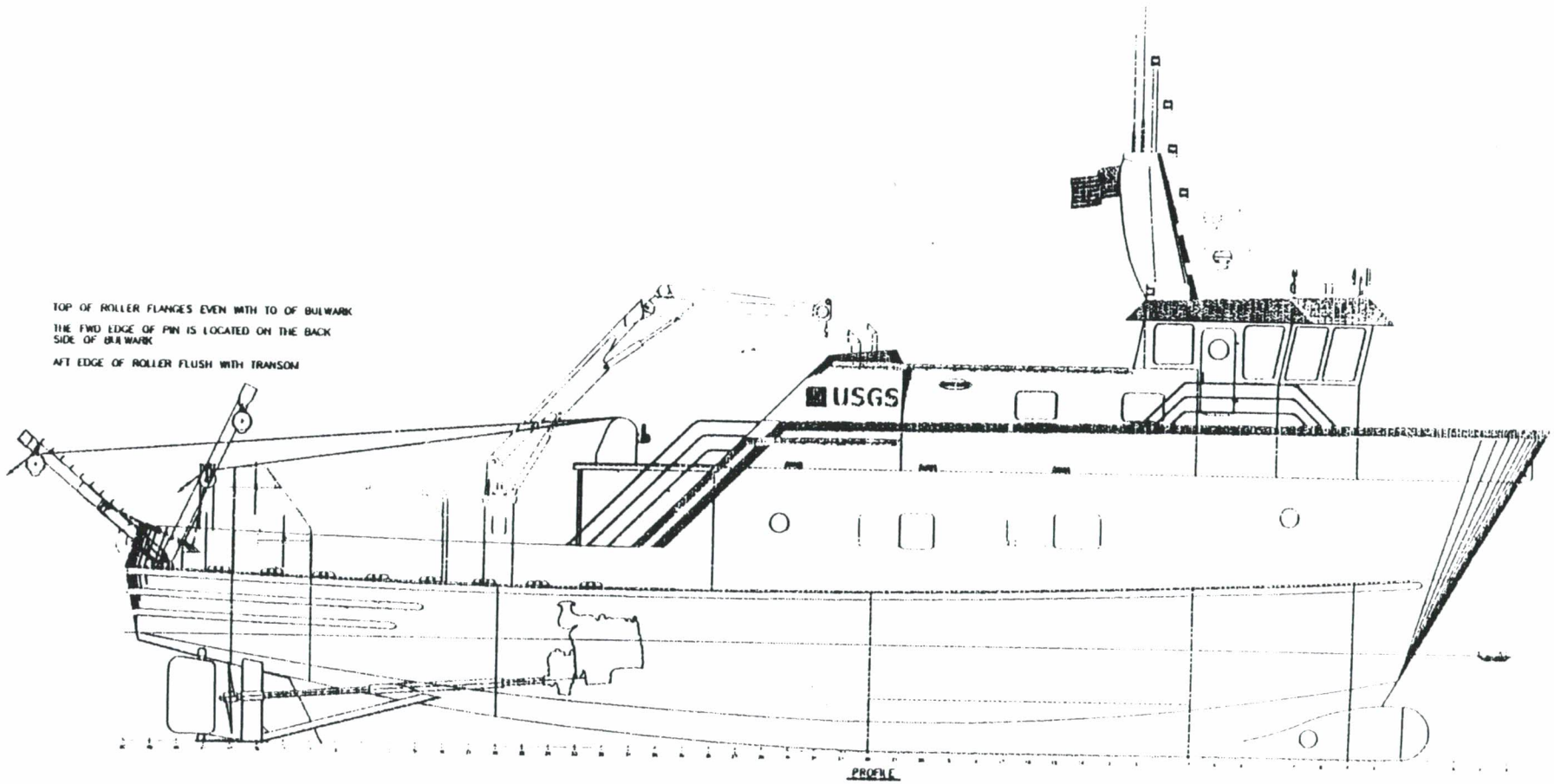
REQUIREMENT	AGOR24	UNOLS Minimum	SWATH 97 Desirable	Maximum	RFP Desired Capabilities "treated as GOALS"	Lockheed/Ingalls Design as of 7/10/98	KAIYO
Station Keeping	S.S. 6	S.S. 6	S.S. 7	NA	S.S.6 +/- 50m		S S 6
Pitch		4 degrees	3 degrees	NA			
Roll		8 degrees	6 degrees	NA			
Heave		6 ft.	4 ft.	NA			
Vertical Accel.		0.4g	0.09g	NA			
Horizantal Accel.		0.2g	0.11g	NA			
Deck Space	2800	2000 sq ft			2000 sq ft	3800 sq ft	10500 sq ft
Science Payload	240LT	60LT	100LT	120LT	100LT	100LT	490LT
Draft	17 ft			17 ft	17 ft	25 5	21 ft
Beam	52			104 ft		88 ft	92 ft
Laboratory Space	4800 sq ft	2500 sq ft	3000 sq ft		3000 sq ft	3025 sq ft	630 sq ft
Science Staff	38	20	25	30	25	30-32	53
Speed Cruising	15 kts	10kts@ss6	15kts@ss6		15 kts	14 kts	13 3 kts
Endurance	60 days	40 days	50 days	50 days	50 days		100
Range	10000 nm	9000nm	10000nm	10000nm	10000nm	9360 nm	5100 nm
Science Gear	21000 cu ft	10000 cu ft	15000 cu ft		15000 cu ft	16384 cu ft	30000 cu ft
Displacement	3200LT					2370LT	3500LT
Mission Equip.							
Multibeam sys.	Yes					Yes	
3khz echosounder	Yes					Yes	
12khz echosounder	Yes					Yes	
Sea water probe	Yes					Yes	
Vertical ref. Sys.	Yes					Yes	
Instriment well	Yes					Yes	
A-frame	Yes					Yes	
a-frame power pack	Yes					Yes	
2- cranes	Yes					Yes	
CTD DESH-5	Yes					Yes	
CTD handling sys	Yes					Yes	
Traction winch	Yes					Yes	
SARCOM M	Yes					Yes	
SIS	Yes					Yes	
DP system	Yes					Yes	

APPENDIX 8

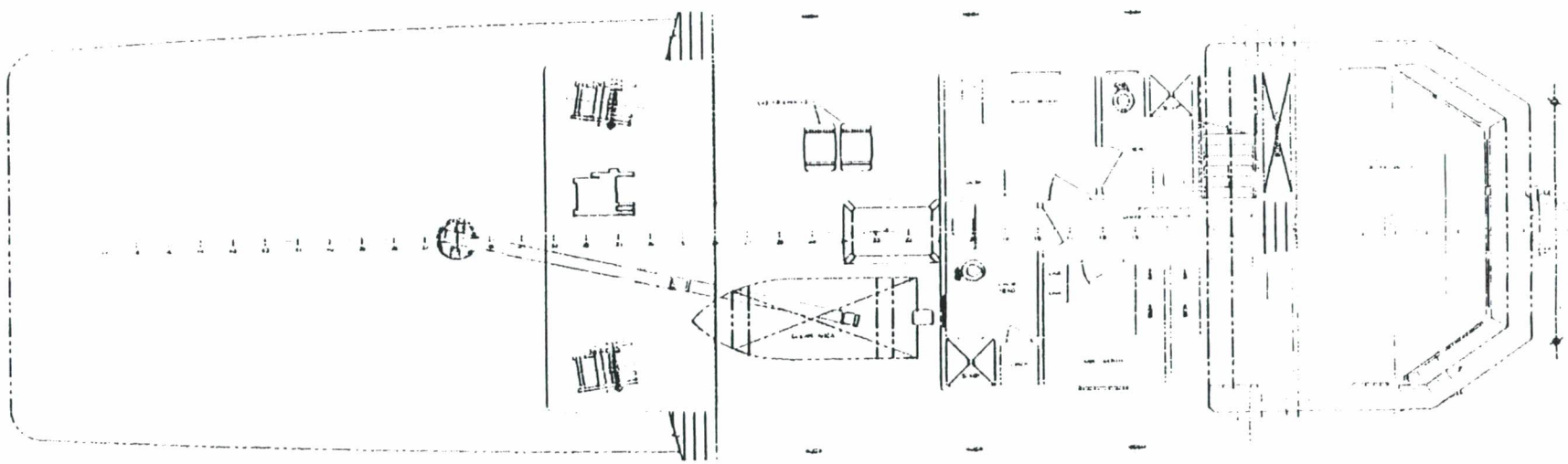
TOP OF ROLLER FLANGES EVEN WITH TO OF BULWARK

THE FWD EDGE OF PIN IS LOCATED ON THE BACK SIDE OF BULWARK

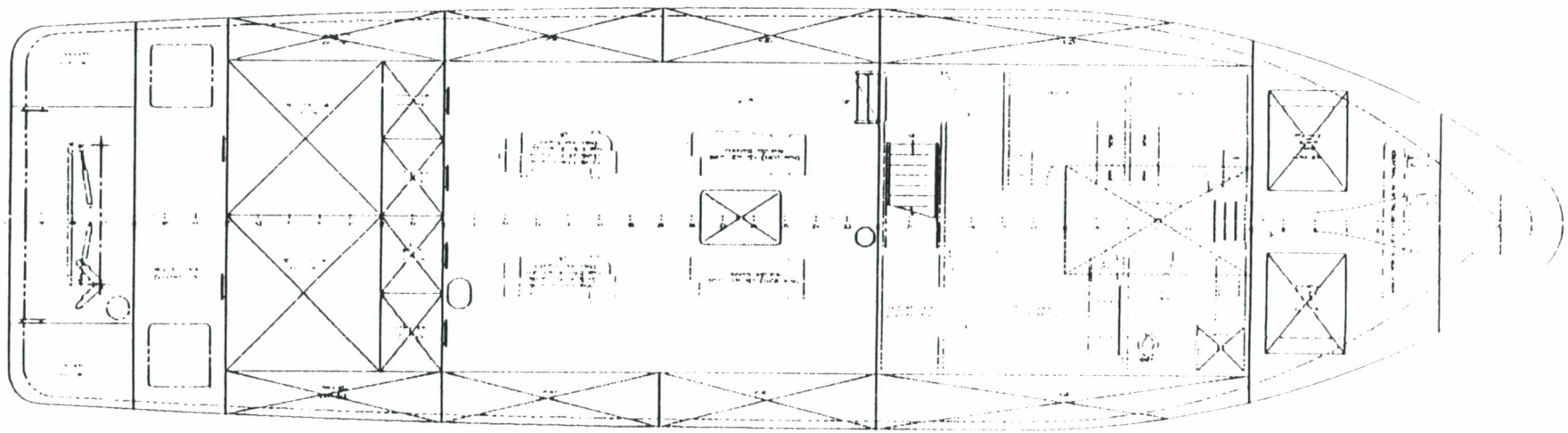
AFT EDGE OF ROLLER FLUSH WITH TRANSOM



PROFILE

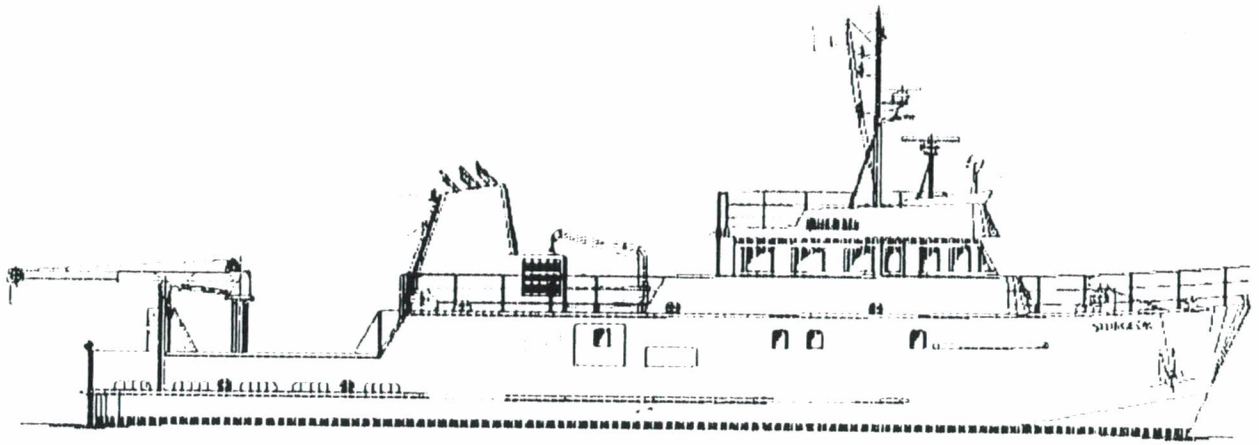


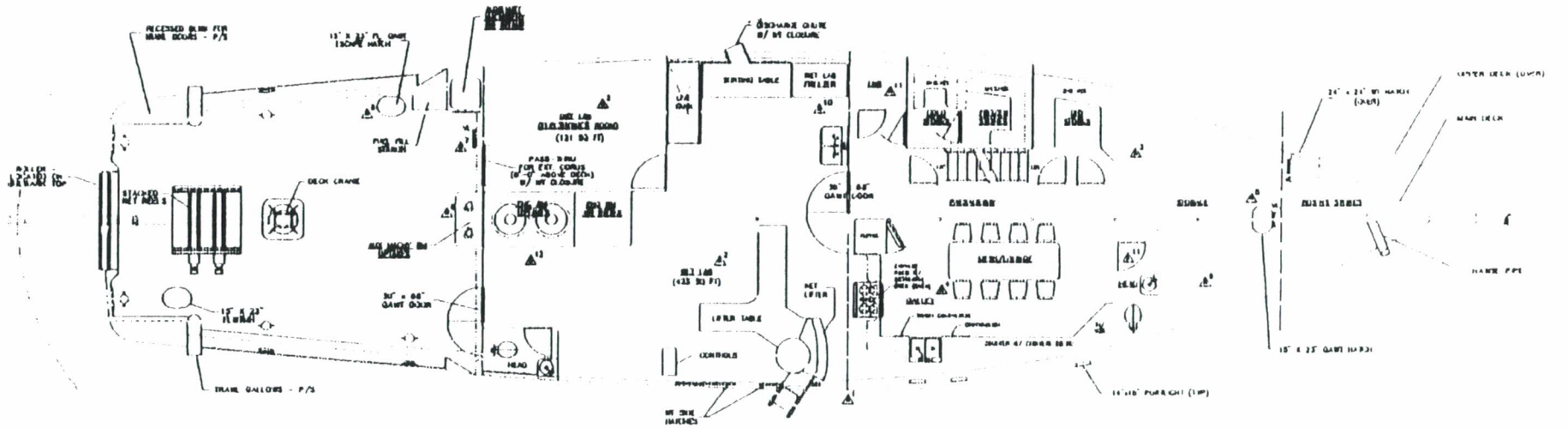
UPPER DECK PLAN



HULL PLAN

APPENDIX 9



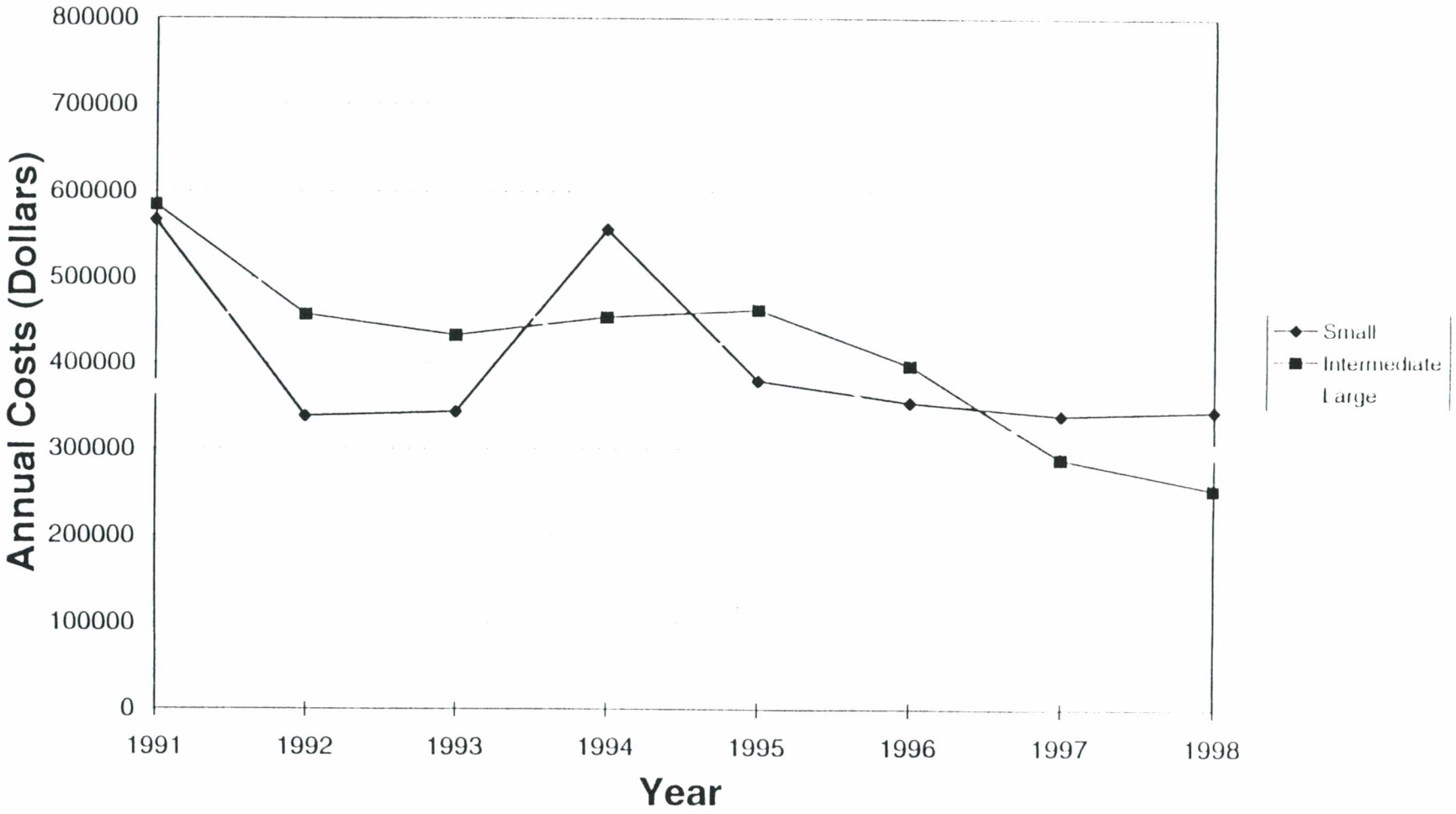

RECESSED BLOW FOR HOSE BOXES - P/S
DECK CRANE
TRAWL GALLOWS - P/S
HEAD
SORTING TABLE
NET LAB FREEZER
LAB
GALLEY
MESS/LOUNGE
LOCKERS
WHEELHOUSE
HAND RAIL

APPENDIX 10

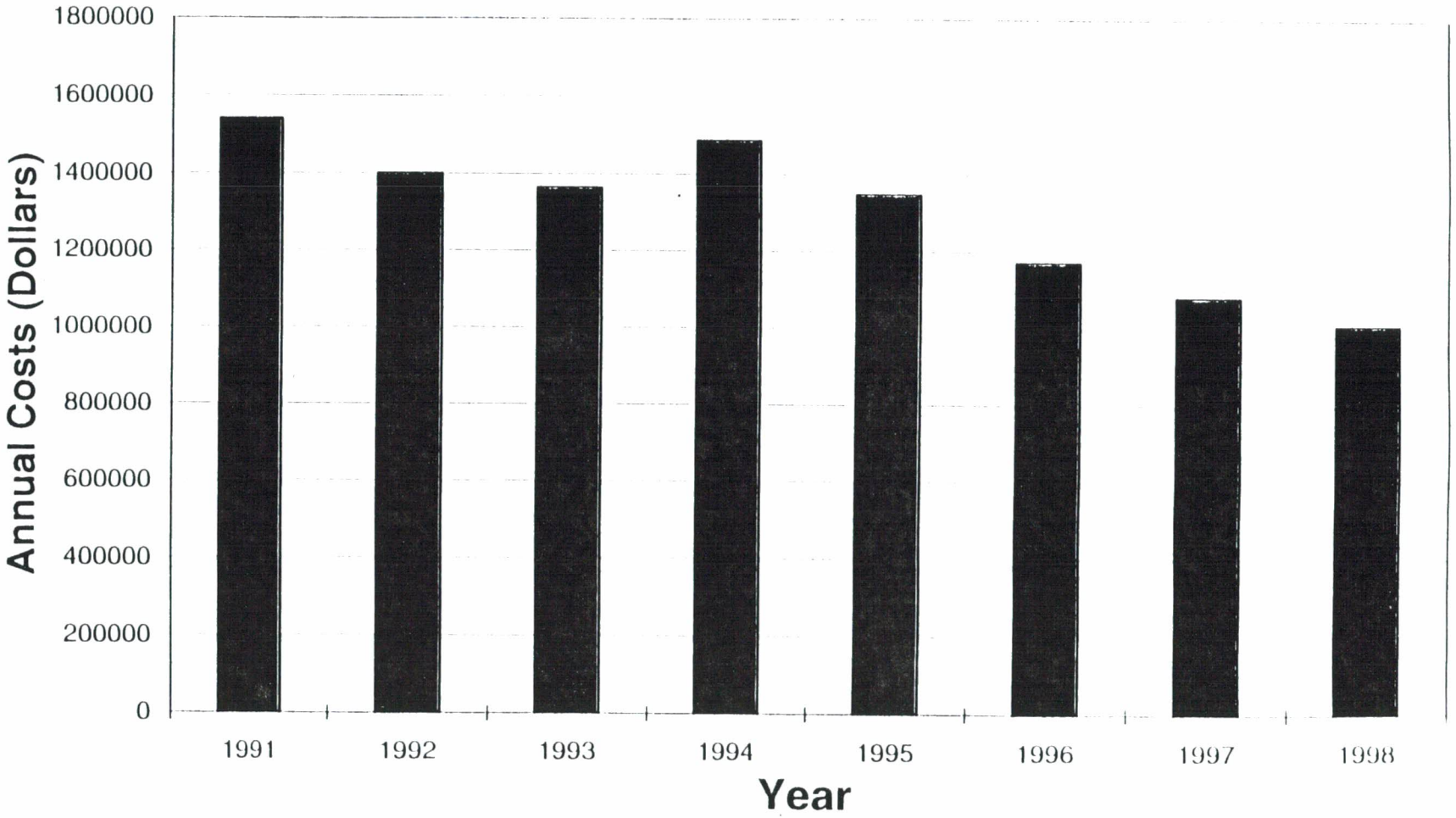
Insurance Expenditures 1991-98

Institutions/Ship	1991	1992	1993	1994	1995	1996	1997	1998
Alaska/Alpha Helix	60	60	60	75	78	77	69	69
Bermuda/Weatherbird	51	50	52	32	33	31	31	31
California/Sproul	35	33	35	20	21	20	17	11
California/New Horizon	74	65	55	24	22	22	19	12
California/Melville	0	42	53	54	51	49	40	29
California/Reveille						14	48	37
Columbia/Ewing	240	309	234	131	161	147	88	85
Delaware/Cape Henlopen	47	47	47	36	27	27	25	26
Duke/Cape Hatteras	60	35	46	63	83	74	60	60
HBOI/Edwin Link	50	63	59	62	49	57	40	44
HBOI/Seward Johnson	64	79	79	62	86	97	44	48
HBOI/Sea Diver				43	16	21	24	26
Hawaii/Moana Wave	20	40	46	57	58	49	46	43
Louisiana/Pelican	100	0	0	0	11	25	26	25
Miami/Calanus	118	21	21	21	11	4	10	13
Miami/Iselin	192	31	33	34	30			
Michigan/Laurentian	8	9	9	19	30	16	16	16
Oregon/Wecoma	45	25	35	45	40	0	0	0
Rhode Island/Endevour	108	123	42	86	65	61	55	49
San Jose State/Point Sur	54	54	43	45	45	38	48	50
Skidaway/Blue Fin	12	12	12	12				0
Smithsonian/Urruca					10	10	2	2
Texas A&M/Gyre	12	6	45	45	73	76	21	20
Texas/Longhorn								
Washington/Barnes	22	18	19	190	15	12	12	16
Washington/Thompson	58	116	126	120	123	118	99	81
WHOI/Atlantis II	74	85	98	96	96			
WHOI/Atlantis							45	67
WHOI/Knorr		34	59	59	55	64	93	67
WHOI/Oceanus	20	25	39	39	40	36	64	38
WHOI/Alvin	17	19	19	18	21	28	40	43
Total Insurance Expenditures	1541	1401	1366	1488	1350	1173	1082	1008

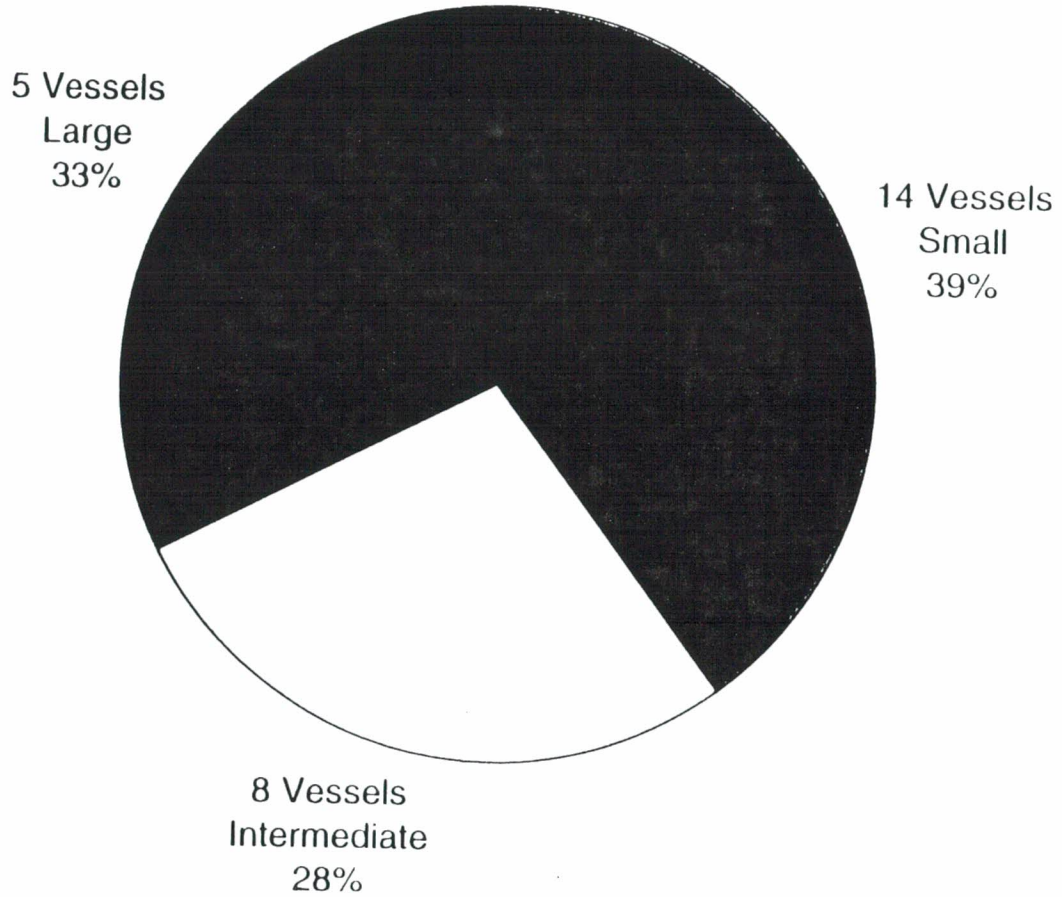
Insurance Expenditures By Class, 1991-98



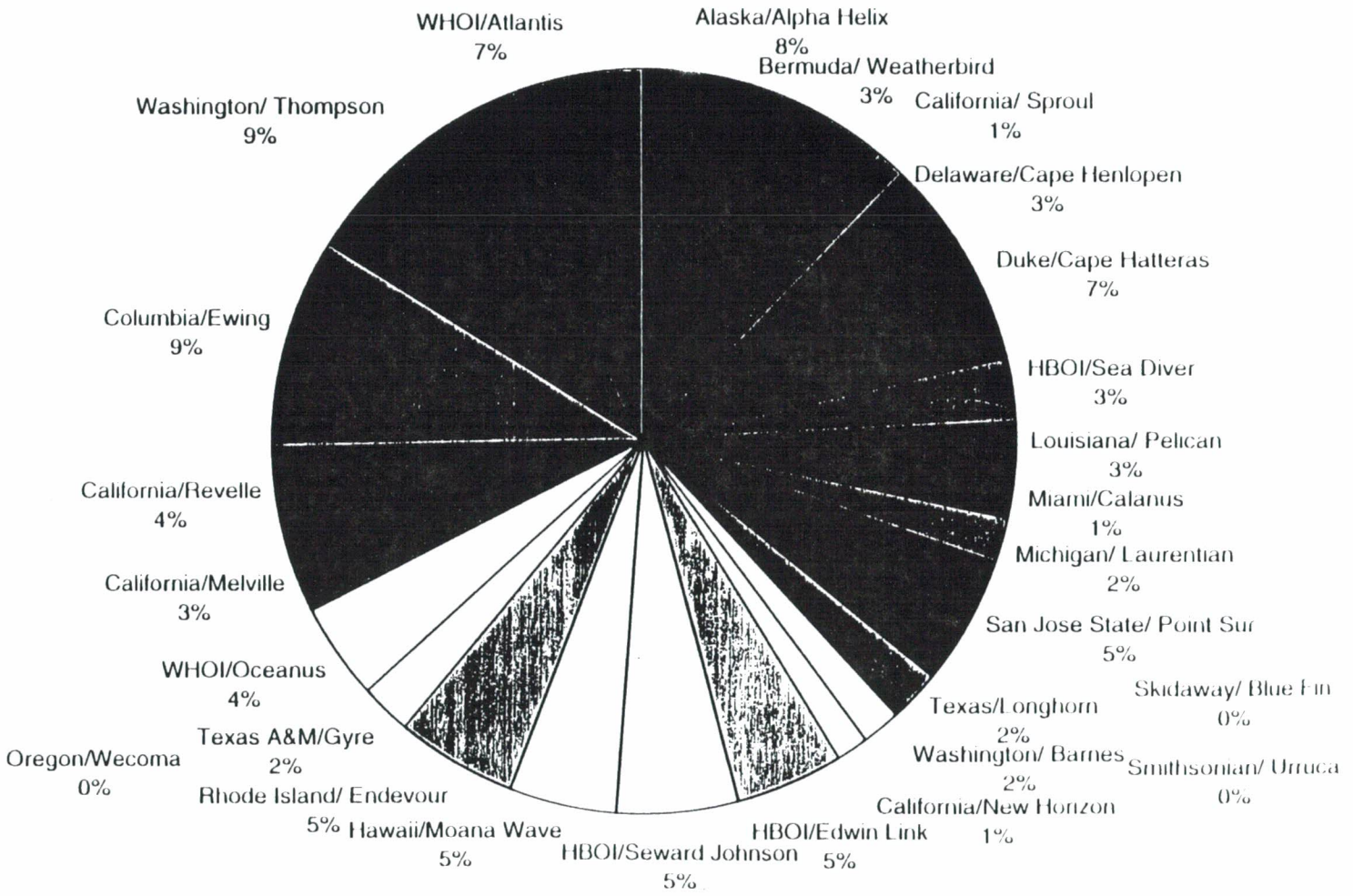
Insurance Expenditures 1991-98



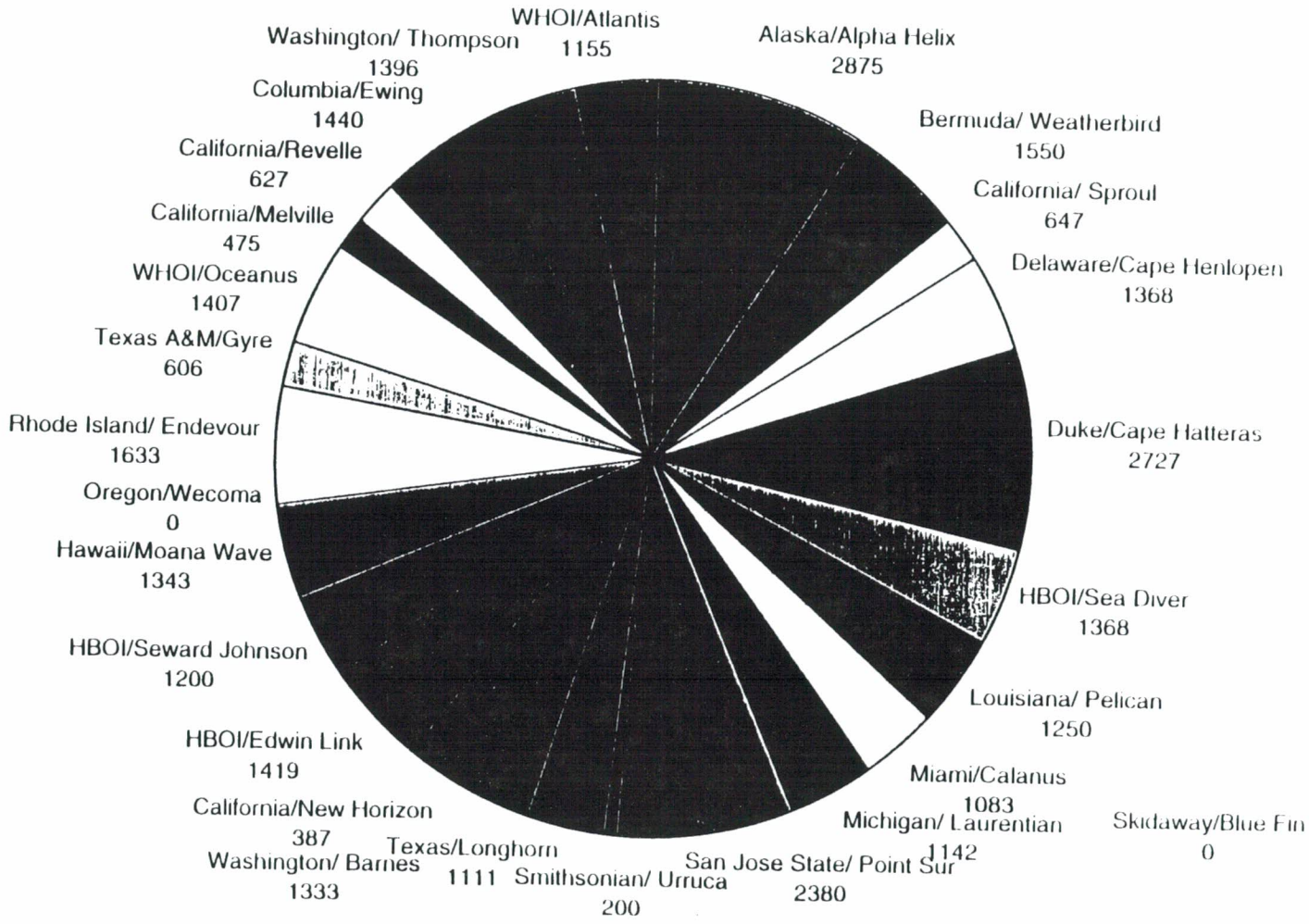
Insurance Expenditures By Class, 1998



Insurance Expenditures Per Vessel, 1998

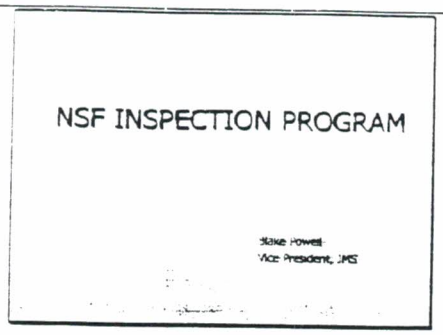


Insurance Expenditures Per Person, 1998

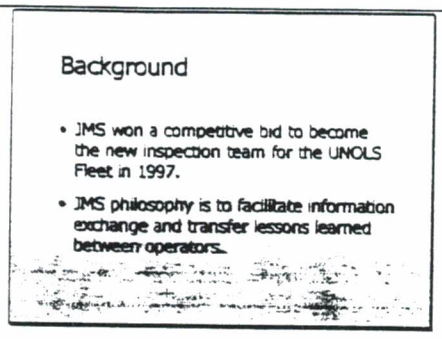


APPENDIX 11

Slide 1



Slide 2

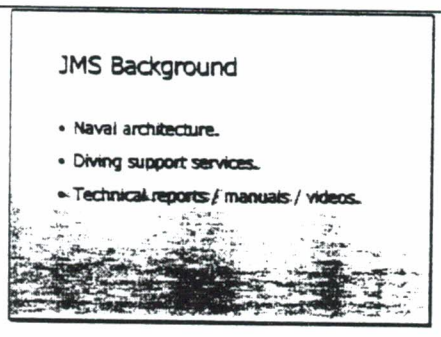


JMS provides third party independent perspective.

Results of inspection used to increase safety awareness and prioritize maintenance requirements.

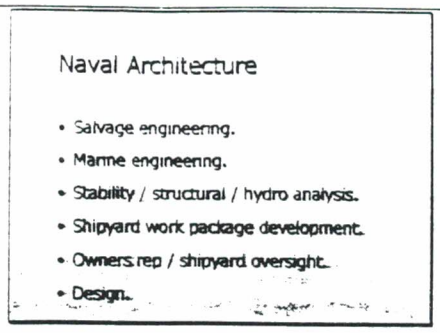
We don't pretend to know more about how to operate your ship than the crew itself. We try to identify the best from each ship and transfer it across the fleet.

Slide 3

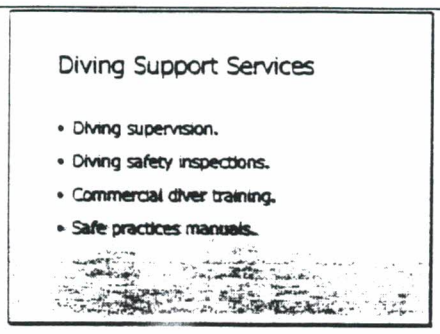


JMS background and personnel provide the perspective we bring to the inspections.

Slide 4



Slide 5



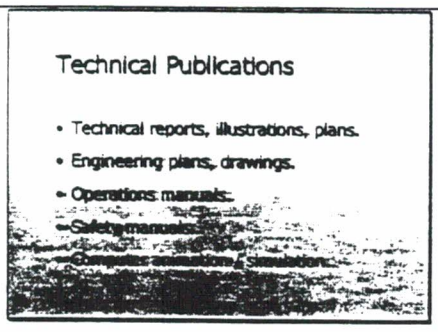
Bath Iron Works diving supervision.

Seaward Marine Services safety inspections.

State of Maine Sea Urchin Safety Trng Program.

DIT: possibility of introducing research diving curriculum and ROV trng.

Slide 6



USN Salvage Manuals

T&S Books, Fire Plans, Loading Mans, Vessel Drawings

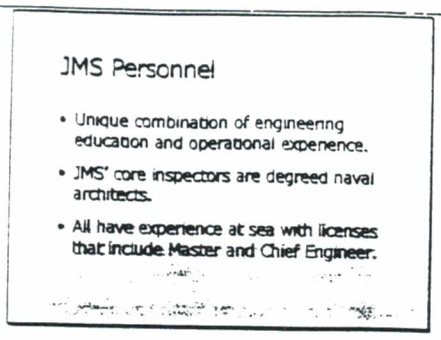
SOPEPs, VRP

Documentatnes: Squalus, Lusitania, Flying Ent, Andera Doria, Scorpion

Promotional / concept design animation

Backed by nav arch expertise - technically accurate

Slide 7

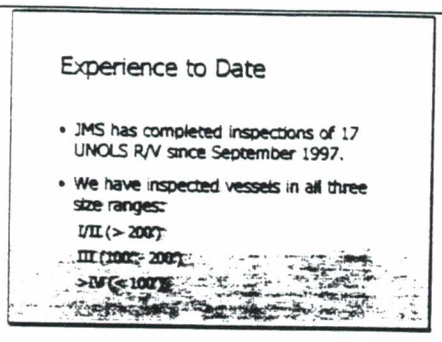


Operational experience separates us from traditional naval arch firms.

Graduate degrees, PE's.

Research vessel, commercial ship and naval vessel experience.

Slide 8



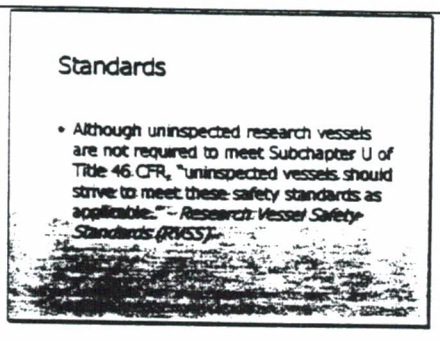
Just finished Urraca and Calanus

Ed Link in Dec

Scripps and Endeavor remain from UNOLS fleet

Others: GLSC, KOK, U of Minn

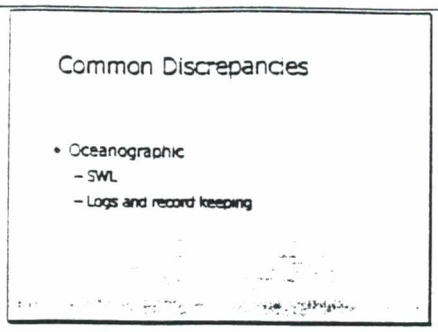
Slide 9



RVSS is the reference but we incorporate CFR, MARPOL, etc as applicable as well as 'good marine practice' which includes what we have found on other UNOLS vessels that works well.

We try to be objective and offer references as much as possible.

Slide 10

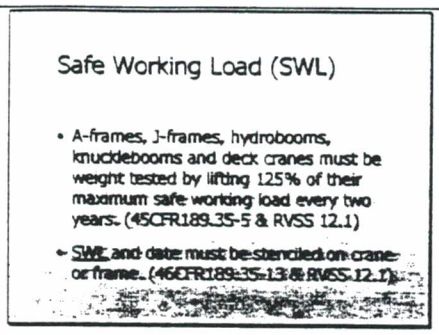


"Common discrepancies" should be "goals and objectives".

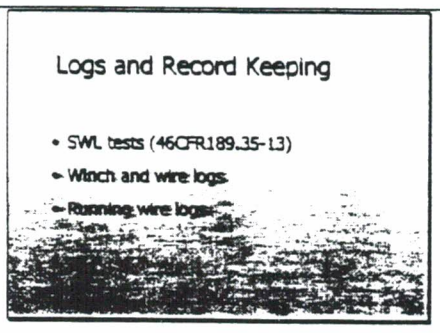
Not intended to be a negative look backwards. Consider it a list of things the fleet should work towards.

Safety Committee may want to consider these things as guidance for future revisions to RVSS.

Slide 11



Slide 12



SWL May be stenciled on the crane but should also be logged with date, exact weight lifted, etc.

Crane and frame logs can be combined with maintenance logs.

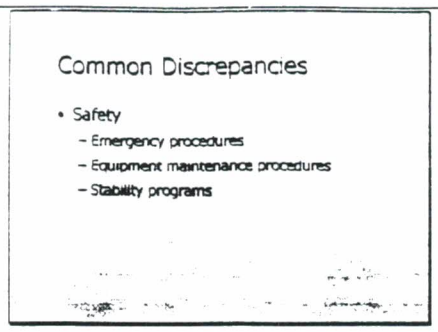
Running wire logs and wire history logs should be kept.

If wire is on portable spool, log should follow wire.

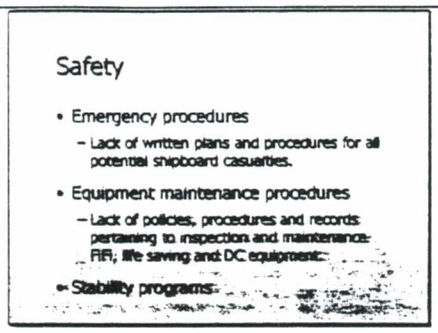
Running wire logs can be recorded manually or by data acquisition system.

Minimally following data should be recorded:
amount of wire out
max observed tension

Slide 13



Slide 14



Emergency Procedures Man should cover applicable compartments/areas for FiFi, flooding, chemical spill, etc.

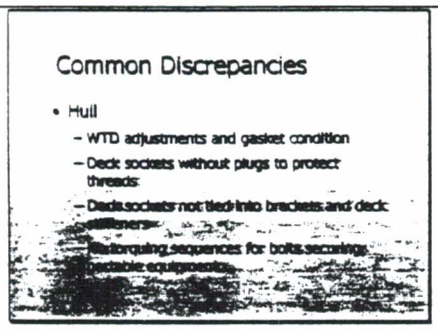
Should have a sked of drills.

Equipment maintenance policy should include
- inventory and location of each piece of equip
- maintenance / inspection procedures for each
- maintenance sked

<u>Lack of formal procedures results in haphazard inspections and maintenance.</u>

Have not seen a good example of a useful, user friendly computerized stability program on any ship.

Slide 15

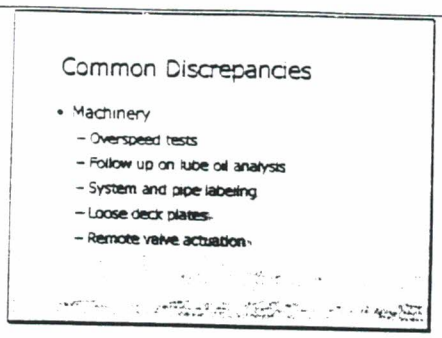


No documentation exists that certifies the proof load of deck sockets or securing devices.

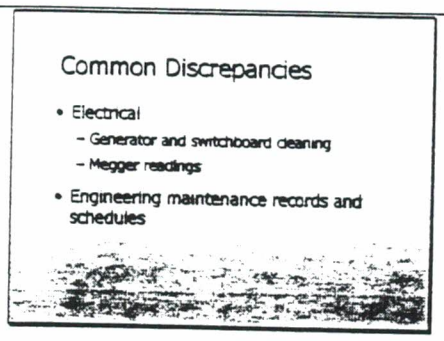
Consideration should be given to developing a Cargo Securing Manual (CSM).

CSM's should at a minimum contain:
- an inventory of all fixed and portable securing devices aboard
- maximum safe loads of each
- proper methods of securing cargo (science and berthing vans, portable cranes/winches)

Slide 16

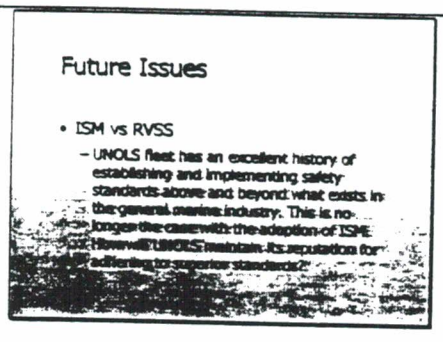


Slide 17



Maintenance emphasis tends to be corrective not preventive.

Slide 18



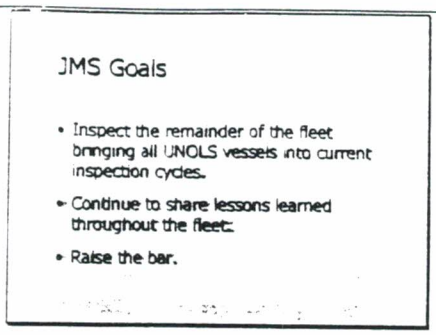
There is a lot of concern about who is legally required to implement ISM.

Should be more talk about what makes sense from a safety point of view. If there is a better safety management system that is internationally recognized, why not adopt it?

RVSS is an excellent start but falls short of a complete safety management program.

Recommend a general / broad ISM program that all operators adhere to (similar in philosophy to the RVSS) then let individual operators tailor it to fit their institution.

Slide 19



Unscheduled ships - Sproul, New Horizon and Endeavor

High level of competency exists within the UNOLS fleet. Take the best from every ship and spread it around.

Continue to have fun. We enjoy being associated with UNOLS "as your 'safety consultants'." Plan to be around for a long time and provide consistency throughout the fleet.

APPENDIX 12

The Revised

STCW Convention

The 1995 Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

ABS® INTEGRATED SERVICES INC.

SAFETY • QUALITY • ENVIRONMENT

Marine Services Division

The Revised

STCW Convention

The 1995 Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

ABS INTEGRATED SERVICES INC.

Marine Services Division

'78 STCW Convention

Adopted on 7 July 1978 - Entered into force 28 April 1984

International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)

'78 Convention

- includes comprehensive knowledge requirements
- excludes common standards to measure knowledge
- excludes any reference to competency
- evidence that knowledge has been absorbed to be determined 'to the satisfaction of the Administration'

'78 Convention (cont.)

The '78 Convention has not been adhered to since...

- the provisions have been open to different interpretation.
- the provisions have not provided sufficient guarantees to ensure that STCW requirements have been implemented or sufficiently enforced

Chart 4

Marine Services Division

'78 Convention (cont.)

- Directed towards traditional departmental organization thereby affecting the opportunity to integrate shipboard practices consistent with advancing technologies
- Excluded reference to advancing training technology such as simulators

Chart 5

Marine Services Division

Revised Convention

Revised *STCW Convention*

The revised STCW has explicit requirements for:

- Seafarers
- Companies
- Governments
- Flag States
- Port States
- Training Institutions

The revised STCW has implicit requirements for...

- Manning Agencies

Chart 6

Marine Services Division

Structure and Format

Revised *STCW Convention*

- 17 Articles - Remain unaltered
- Annex of Regulations - Expanded from 6 to 8 chapters - two new chapters VII and VIII
- New STCW Code divided into 2 sections:
  - Part 'A' - Mandatory Requirements
  - Part 'B' - Recommendatory Guidance

Revised *STCW Convention*

STCW '95
Regulations and Code

Structure and Format

Revised *STCW Convention*

- ***Regulation and Code***
  - Chapter I: General Provisions
  - Chapter II: Master and deck department
  - Chapter III: Engine department
  - Chapter IV: Radio communication and radio personnel
  - Chapter V: Special training requirements for personnel on certain types of ships
  - Chapter VI: Emergency, occupational safety, medical care and survival functions
  - Chapter VII: Alternative certification
  - Chapter VIII: Watchkeeping

Revised
STCW Convention

Chapter I
General Provisions

Chart 10

Marine Services Division

Regulation I/2: Certificates and endorsements

Revised
STCW Convention

- Certificates shall be in the official language or languages of the issuing country. If the language is not English, the text shall include a translation into that language
- An Administration recognizing a certificate not issued by it shall endorse such certificate to attest its recognition
- The endorsement is issued as a separate document and expires as soon as the certificate expires or is withdrawn, suspended, or canceled by the issuing Party and in any case not more than five years after the date of issue
- Administrations can have alternative format as long as it has the required information to identify the authorized capacity of the holder
- Certificate must be held in its original form onboard ship

Chart 11

Marine Services Division

Regulation I/4: Control procedures

Revised
STCW Convention

Port State Control

- Control by a duly authorized control officer shall be limited to the following:
  - seafarers hold appropriate certificates or valid dispensation
  - number of certificates comply with the safe manning requirements
  - assessing the ability of seafarers to maintain watchkeeping standards if there are clear grounds such as:
    - collision, grounding or stranding
    - discharge of a substance
    - maneuvering in an erratic manner
    - ship is being operated in a manner posing danger

Chart 12

Marine Services Division

Regulation I/4: Control procedures (cont.)

Revised *STCW Convention*

Deficiencies posing a danger:

- Failure to comply with the safe manning requirements
- Failure of navigational or engineering watch arrangements to conform to the requirements specified for the ship
- Absence in a watch of a person qualified to operate equipment essential to safe navigation, radio communications, or the prevention of marine pollution
- Inability to provide for the first watch at the commencement of a voyage and for subsequent relief watches persons sufficiently rested and otherwise fit for duty
- Failure to correct any of these deficiencies, and a Party is given clear grounds that they pose a danger to persons, property or the environment, may detain a ship

Section A-I/4: Control procedures

Revised *STCW Convention*

Port State Control

- Assessment procedure shall be limited to a verification that crew members possess the necessary skills related to the occurrence
- Onboard procedures are relevant to the ISM Code and the provisions of this Convention are confined to competence of safely executing those procedures
- Control procedures shall be confined to the standards of competence of individual seafarers onboard and their skills related to watchkeeping as defined by Part A of the Code
- Onboard assessment of competency shall commence with verification of seafarer certificates
- Notwithstanding verification of the certificate, a seafarer can be required to demonstrate the related competence at the place of duty.

Regulation I/5: National Provisions

Revised *STCW Convention*

- Each Party shall establish processes and procedures for impartial investigation of reported incompetence, act or omission posing danger
- Each Party shall prescribe penalties or disciplinary measures
- These penalties and disciplinary measures shall be particularly applied when:
  - a company or master has engaged a person not holding appropriate certificate
  - master has allowed any function or service to be conducted by person not holding appropriate certificate or dispensation
  - a person has obtained by fraud or forged documents and performing functions pertaining to that document

Regulation I/6: Training and assessment

Revised *STCW Convention*

- Each Party shall ensure that those responsible for training and assessment of competence of seafarers are appropriately qualified for the type and level of training or assessment involved
- Training and assessment are in accordance with section A-I/6 of the STCW Code

Section A-I/6: Training and assessment

Revised *STCW Convention*

- Each Party shall ensure that all training and assessment of seafarers for certification under the Convention is:
  - structured in accordance with written programs, including such methods and media of delivery, procedures, and course material as necessary to achieve the prescribed standard of competence
  - conducted, monitored, evaluated and supported by qualified persons
- Persons conducting in-service training or assessment on board shall only do so when training or assessment will not adversely affect normal ship operation and they can dedicate their time and attention to the requirements

Section A-I/6: Training and assessment (cont.)

Revised *STCW Convention*

Qualification of instructors, supervisors and assessors

- Each Party shall ensure that instructors, supervisors and assessors are appropriately qualified for the particular types and level of training or assessment of competence of seafarers either on board or ashore as required by the Convention.

Section A-I/6: Training and assessment (cont.)

Revised *STCW Convention*

In service training (general)

- Any person conducting in-service training of a seafarer onboard, which is intended to be used in qualifying for certification shall:
  - have an appreciation of the training program and understanding of the specific training objectives for the particular type of training
  - be qualified in the task for which training is being conducted

In service training (simulators)

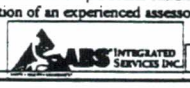
- Any person conduction in-service simulator training of seafarers, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:
  - have received appropriate guidance in instructional techniques involving the use of simulators
  - have gained practical operational experience on the particular type of simulator being used

Section A-I/6: Training and assessment (cont.)

Revised *STCW Convention*

Assessment of competence (in-service training)

- Any person conducting in-service assessment of competence of a seafarer on board or ashore shall:
  - have an appropriate level of knowledge and understanding of the competence to be assessed
  - be qualified in the assessment methods and practices
  - received appropriate guidance in assessment methods and practices
  - have gained practical assessment experience
  - if assessment involves the use of simulators, that person has to have gained practical assessment experience on the particular simulator under supervision of and to the satisfaction of an experienced assessor



Section A-I/6: Training and assessment (cont.)

Revised *STCW Convention*

Training and assessment within an institution

- Each Party recognizing a course of training, a training institution, or a qualification granted by a training institution shall ensure the qualifications and experience of instructors and assessors are covered in the application of a quality standard provisions (see regulation I/8).
- The qualifications, experience and application of quality standards shall incorporate appropriate training in instructional techniques, and training and assessment methods and practice and comply with all applicable requirements for in-service training and competence assessment.

Section A-I/7: Communication of information (cont.)

Revised *STCW Convention*

Each Party shall within six months of ....

- **retaining or adopting any equivalent education or training arrangements** (article IX) provide a full description of those arrangements
- **recognizing certificates issued by another Party**, provide a report summarizing measures taken to ensure compliance with their program (regulation I/10)
- **authorizing employment of seafarer holding alternative certificates** (regulation VII) on ships entitled to fly its flag, provide a specimen copy of a safe manning document issued to those types of vessels
- **evaluating quality system requirements** (regulation I/8), provide terms of reference of the evaluators, their qualifications and experiences, date and scope of evaluations, deficiencies found and corrective measures recommended and carried out

ABS INTEGRATED SERVICES INC.

Chart 22

Marine Services Division

Regulation I/8: Quality standards

Revised *STCW Convention*

- Each Party shall ensure training, assessment of competence, certification, endorsement and revalidation activities carried out by non-governmental agencies under its authority are continuously monitored through a quality standard system.
- Where governmental agencies or entities perform such activities, there shall be a quality standard system.

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Chart 23

Marine Services Division

Section A-I/8: Quality standards

Revised *STCW Convention*

- Each Party shall ensure education and training objectives and related standards of competence are clearly defined
- Each Party shall identify levels of knowledge, understanding, and skills appropriate to the examination and assessment required under the Convention
- The quality standard shall cover the following items with regard to the policies, systems, controls and internal quality assurance reviews:
  - the administration of the certificate system
  - all training courses and programs
  - examination and assessment and qualifications and experience required of instructors and assessors

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Chart 24

Marine Services Division

Section A-I/8: Quality standards (cont.)

Revised *STCW Convention*

- Each Party shall ensure independent evaluation of the administration of the certification system in intervals of no more than five years to verify:
  - all internal management control and monitoring measures and follow-up actions comply with planned arrangements and documented procedures
  - the results of each independent evaluation are documented and brought to the attention of those responsible for the area evaluated
  - timely action is taken to correct deficiencies

Chart 25

Marine Services Division

Regulation I/9: Medical standards - issue and recognition of certificates

Revised *STCW Convention*

- Each Party shall establish standards for medical fitness, particularly hearing and eyesight
- Certificates only issued to candidates complying with standards
- Candidates must supply information on the following:
  - identity
  - age (not less than that prescribed for certificate applied for)
  - meet standards of medical fitness
  - have completed seagoing service and any related compulsory training requirements
  - meet standards of required competence

Chart 26

Marine Services Division

Regulation I/9: Medical standards - issue and recognition of certificates (cont.)

Revised *STCW Convention*

- Each Party must maintain a register of all certificates and endorsements for masters, officers and ratings which are issued, have expired or revalidated, suspended, canceled or reported lost or destroyed and of dispensations issued
- Each Party must make available information on the status of such certificates, endorsements and dispensations to other Parties and companies which request verification of the authenticity and validity of certificates produced to them by seafarers seeking recognition of their certificates or employment on board ship

Chart 27

Marine Services Division

Regulation I/10: Recognition of certificates

Revised *STCW Convention*

- Each Administration shall ensure a certificate issued by or under the authority of another Party to a master, officer or radio operator that:
  - the Administration has confirmed, which may include inspection of facilities and procedures, that the requirements concerning standards of competence, the issue of endorsement of certificates and record keeping are fully complied with by the issuing party
  - prompt notification by the other party to the Administration is given for any significant changes in the arrangements for training and certification

Regulation I/10: Recognition of certificates (cont.)

Revised *STCW Convention*

- Seafarers presenting certificates for management level (officers) have knowledge of maritime legislation of the Administration relevant to the functions they are permitted to perform
- An Administration may allow seafarers to serve in a capacity for a period not exceeding 3 months while holding an appropriate and valid certificate issued and endorsed by another Party. This is to allow for endorsement by the flag State on the particular ship the seafarer is serving
- Certificates and endorsements issued by an Administration in recognition of a certificate issued by another Party, shall not be used as a basis for further recognition by another Party

Regulation I/11: Revalidation of certificates

Revised *STCW Convention*

- Masters, officers and radio operators holding a certificate issued or recognized under any chapter of the Convention (except chapter VI) serving at sea or intending to return to sea is required, in intervals not exceeding 5 years, to:
  - meet the standards of medical fitness (regulations I/9)
  - establish continuous professional competence in accordance with the STCW Code
- Parties shall compare the standards of competence required of candidates for certificates issued before 1 February 2002 to determine if appropriate refresher and updating training or assessment is needed
- Texts of recent changes in national and international regulations should be made available to ships flying its flag

Section A-I/11: Revalidation of certificates

Revised *STCW Convention*

- Continued professional competence shall be established by:
  - approved seagoing service performing functions appropriate to the certificate held for a period of at least one year in total during the last 5 years; OR
  - having performed functions considered to be equivalent to seagoing service, OR one of the following:
    (1) passed an approved test, OR
    (2) completed approved course(s), OR
    (3) having completed approved seagoing service, performing functions appropriate to certificate held for not less than 3 months as supernumerary, OR in a lower rank than that for which the certificate held is valid
- Refresher and updated courses shall be approved and include changes in national and international regulations directly affecting provisions in the Convention

Section A-I/12: Use of simulators (cont.)

Revised *STCW Convention*

- **Training procedures**
  - trainees are adequately briefed on exercise objectives and tasks and given sufficient planning time prior to the exercise
  - trainees have adequate familiarization time on simulator
  - guidance given and exercise stimuli are appropriate to selected exercise objectives and tasks
  - exercises are effectively monitored, supported by audio and/or visual observation of trainee activity and given pre/post exercise evaluation reports
  - trainees are effectively debriefed to ensure training objectives have been met and that skills are demonstrated to an acceptable standard
  - the use of peer assessment during debriefing is encouraged
  - simulator exercises are designed and tested so as to ensure their suitability for the specified training objectives

Section A-I/12: Use of simulators (cont.)

Revised *STCW Convention*

- **Assessment procedures**
  - performance criteria are identified clearly, explicitly and available to candidates
  - assessment criteria are clearly established - minimize subjective judgment
  - candidates are briefed clearly on the tasks and/or skills to be assessed and on the task and/or skills to be assessed and on the task and performance criteria by which their competency will be determined
  - assessment of performance takes into account normal operating procedures and any behavioral interactions between relevant personnel
  - scoring or grading methods to assess performance are used with caution until they have been validated
  - prime criterion is that candidates demonstrate their ability to conduct tasks safely and effectively to the satisfaction of the assessor

Section A-I/12: Use of simulators (cont.)

Revised *STCW Convention*

- Qualifications of instructors and assessors require each Party to ensure instructors and assessors are appropriately qualified and experienced for the particular types and levels of training and corresponding assessment of competence as specified in the regulation I/6 (Training and assessment).

Chart 34

Marine Services Division

Regulation I/14: Responsibilities of Companies

Revised *STCW Convention*

Companies are required to ensure that ....

- Each seafarer holds appropriate certificate
- Ships comply with applicable safe manning requirements
- Documentation for seafarers is maintained and readily available regarding experience, training, medical fitness and competency
- Seafarers, on being assigned, are familiarized with relevant routine and emergencies duties
- Ships complement can in an emergency situation effectively coordinate duties vital to safety and pollution prevention

Chart 35

Marine Services Division

Section A-I/14: Responsibilities of Companies (cont.)

Revised *STCW Convention*

- Responsibility for ensuring obligations set out in section A-14 are given full and complete effect.
- Take such measures as may be necessary to ensure each crew member can make a knowledgeable and informed contribution to the safe operation of the ship.
- Provide written instructions to the master of each ship
  - Policies and procedures for all newly employed seafarers' familiarization training
  - Operating procedures and other arrangements for performing duties prior to being assigned

Chart 36

Marine Services Division

Section A-I/14: Responsibilities of Companies (cont.)

Revised *STCW Convention*

- Policies and procedures shall include allocation of time for newly employed seafarers to become acquainted with:

  (a) specific equipment the seafarer will be using

  (b) ship specific duties for watchkeeping, safety, environmental protection and emergency procedures

  (c) designation of knowledgeable crew member to provide information in appropriate language

Section B-I/14: Responsibilities of the Company

Revised *STCW Convention*

- The Master should take all necessary steps to implement any company instructions issued and such steps should include:
  - identifying all newly employed seafarers onboard
  - providing the opportunity for all newly arrived seafarers to:
    - become acquainted with the location, controls and display features of the equipment they are to operate
    - activate the equipment when possible and perform functions using the controls on the equipment
  - providing for suitable supervision when there is doubt a seafarer is unfamiliar with the shipboard equipment, operating procedures and other arrangements

Regulation I/15: Transitional Provisions

Revised *STCW Convention*

1 Feb 1997 — **Convention enters into force**

1 Aug 1998 — **New entrant training required to comply with new standards**

1 Feb 2002 — **All transitional measures end**

Revised
STCW Convention

Chapter II
Master and deck department

Chart 40

Marine Services Division

Standards for seafarer competence

Revised
STCW Convention

- New minimum standards of competence specifies in tabular format the knowledge required by candidates for certification.

  These include:

  - knowledge, understanding, and proficiency
  - methods for demonstrating competence
  - criteria for evaluating competence

Chart 41

Marine Services Division

Revised
STCW Convention

Functional divisions at the operational level

- Chapter II - Officers in charge of a navigational watch of 500 grt or more

Chart 42

Marine Services Division

Chapter II - Officers in Charge of a Navigational Watch of 500 G.R.T. or More

Revised *STCW Convention*

Function -Navigation (Competence)

- Plan and conduct a passage and determine position
- Maintain a safe navigational watch
- Use a radar and ARPA to maintain safety of navigation
- Respond to emergencies
- Respond to a distress signal at sea
- Use IMO standard marine communication phrases and use English in written and oral form
- Transmit and receive information by visual signaling
- Maneuver the ship

Marine Services Division

ABS INTEGRATED SERVICES INC.

Chart 43

Chapter II - Officers in Charge of a Navigational Watch of 500 G.R.T. or More

Revised *STCW Convention*

Function - Cargo Handling

Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage

Function - Controlling the Operation of the Ship and Care for Persons Onboard

- Ensure compliance with pollution prevention requirements
- Maintain seaworthiness of the ship
- Prevent, control and fight fires onboard
- Operate life saving appliances
- Apply medical first aid onboard ship
- Monitor compliance with legislative requirements

Marine Services Division

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Chart 44

Revised *STCW Convention*

Functional divisions at the operational level

- Chapter III - Officers in charge of an engine-room watch of 750 kW or more

Marine Services Division

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Chart 45

Chapter III - Engine Department

Revised *STCW Convention*

Function - Marine Engineering

- Use appropriate tools for fabrication and repair operations typically performed on ships
- Use hand tools and measuring equipment for dismantling, maintenance, repair and re-assembly of shipboard plant and equipment
- Use hand tools, electrical and electronic measuring and test equipment for fault finding, maintenance and repair operations
- Maintain a safe engineering watch
- Use English in written and oral form
- Operate main and auxiliary machinery and associated control systems
- Operate pumping systems and associated control systems

ABS Integrated Services Inc.

Chart 46

Marine Services Division

Chapter III - Engine Department

Revised *STCW Convention*

Function - Maintenance and Repair

- Maintain marine engineering systems including control systems

Function - Electrical and Control Engineering

- Operate alternators and control systems

Function - Controlling the Operation of the Ship and Care for Persons Onboard

- Ensure compliance with pollution prevention requirements
- Maintain seaworthiness of the ship
- Prevent, control and fight fires onboard
- Operate live saving appliances
- Apply medical first aid onboard ship
- Monitor compliance with legislative requirements

ABS Integrated Services Inc.

Chart 47

Marine Services Division

STCW 95 Terms

Revised *STCW Convention*

Introduction

- Standards of competence are required to be demonstrated by candidates for the issue and revalidation of certificates specific to the following seven functional areas:
  - Navigation
  - Cargo handling and stowage
  - Controlling the operation of the ship and care for persons onboard
  - Marine engineering
  - Electrical, electronic and control engineering
  - Maintenance and repair
  - Radio communications

ABS Integrated Services Inc.

Chart 48

Marine Services Division

STCW 95 Terms

Revised *STCW Convention*

Introduction (cont.)

- Standards of competencies are required to be demonstrated by candidates for the issue and revalidation of certificates and are grouped together in functions for the following specific levels of responsibility:
  - Management level (Master, chief mate, chief engineer and second engineer)
  - Operational level (officer in charge of a navigational or engineering watch)
  - Support level (performing under the direction of management or operational level)

Standard for seafarer competence

Revised *STCW Convention*

- Approved seagoing service is part of an approved training program
  - Seagoing service depends on assigned duties
- Training record book must be maintained

Requirements for Masters, officers and ratings forming part of a navigational watch

Revised *STCW Convention*

	Age	Approved seagoing service	Supervised bridge watchkeeping duties	Radio requirement	Simulator training
Officer in charge of a navigational watch (> 500 gt)	18	1 year*	6 months	Yes	As appropriate
Chief mate (> 3000 gt)		1 yr			As appropriate
Master (> 3000 gt)		36 months/ 24 months**			As appropriate
Chief mate (500-3000 gt)	18	1 year*	6 months	Yes	As appropriate
Master (500-3000 gt)		36 months/ 24 months**			As appropriate
Ratings	16	6 months		No	As appropriate

* A approved seagoing service in deck department non-approved training

** Must have approved seagoing service of not less than 36 months in that capacity but may be reduced to not less than 24 months if not less than 12 months have been served as chief mate

Requirements for Masters, officers and ratings forming part of a navigational watch

Revised *STCW Convention*

	Age	Approved seagoing service	Supervised bridge watchkeeping duties	Radio requirement	Specified training
Officer in charge of a navigational watch (<500 gt) Near coastal voyage	18	12 months*		Yes	As appropriate
Master (<500 gt) Near coastal voyage		18 months-24 months**			As appropriate
Officer in charge of a navigational watch (>500 gt) Near coastal voyage	18	3 years		Yes	As appropriate
Master (<500 gt) Near coastal voyage	20	12 months			As appropriate

* Approved seagoing service in deck department / non-approved training

** Must have approved seagoing service of not less than 36 months in that capacity but may be reduced to not less than 24 months if not less than 12 months have been served as chief mate

ABS INTEGRATED SERVICES INC.

Chart 52

Marine Services Division

Section A-II/1: Certification of officers in charge of navigational watch (>500 gt) (cont.)

Revised *STCW Convention*

- Every candidate for certification as officer in charge of a navigational watch of ships, for seagoing service, shall follow an approved program of on board training which:
  - ensures during the required period of seagoing service a systematic practical training and experience in the tasks, duties and responsibilities
  - is closely supervised and monitored by qualified officers
  - is adequately documented in a training record book or similar document

ABS INTEGRATED SERVICES INC.

Chart 53

Marine Services Division

Section A-II/1: Certification of officers in charge of navigational watch (<500 gt)

Revised *STCW Convention*

Definition of near coastal voyages means voyages in the vicinity of a Party as defined by that Party

Near coastal voyages

- The following subjects may be omitted for issue of restricted certificates for service on near coastal voyages: celestial navigation, electronic systems of position fixing and navigation that do not cover waters in which the certificate is valid.

ABS INTEGRATED SERVICES INC.

Chart 54

Marine Services Division

Section A-II/3: Certification of officers in charge of navigational watch (<500 gt) (cont.)

Revised *STCW Convention*

Special Training

- Candidates for certification as officer in charge of a navigational watch engaged on near-coastal voyages are required to have completed special training when:
  - ensures systematic practical training and experience in the tasks, duties and responsibilities
  - is closely supervised and monitored by qualified officers
  - is adequately documented in a training record book or similar document

Revised *STCW Convention*

CHAPTER III
Engine department

Requirements for officers and ratings forming part of an engineering watch

Revised *STCW Convention*

	Age	Approved seagoing service	Approved education and training
Officer in charge of engineering watch (>750 kW)	18	6 months*	30 months
Chief engineer (>3000 kW)		36 months of which 12 months must be qualified as 2nd engineer	
Second engineer (>3000 kW)		12 months of approved service	
Chief engineer (750-3000 kW)		24 months of which 12 months must be qualified as 2nd engineer	
Second engineer (750-3000 kW)		12 months of approved service	
Ratings (<750 kW)	16	6 months approved under supervision of qualified engineering officer	As required under supervision of qualified

* Seagoing service does not have to be part of an approved programme

Section A-VI/3: Advanced fire fighting

Revised *STCW Convention*

Standards of competence

- Seafarers designated to control fire-fighting operations shall have successfully completed advanced training in techniques for fighting fire, with particular emphasis on organizational tactics and command.
- Candidates for certification shall be required to provide evidence of having achieved the required standard of competence within the previous five years.

Chart 58

Marine Services Division

Section A-VI/4: Standard of competence for seafarers designated to provide medical first-aid

Revised *STCW Convention*

- Every seafarer who is designated to provide medical first-aid shall be required to demonstrate competence to undertake the listed tasks, duties and responsibilities
- Those designated to take charge of medical aid on board ship must demonstrate competence to undertake the tasks, duties and responsibilities
- Those individuals must be able to provide evidence that they meet the required standard of competency based on the tabulated criteria

Chart 59

Marine Services Division

Revised *STCW Convention*

Chapter VIII
Standards regarding watchkeeping

Chart 60

Marine Services Division

Regulation VIII/1: Fitness for duty

Revised *STCW Convention*

- Each Administration shall, for the purpose for preventing fatigue:
  - establish and enforce rest periods for watchkeeping personnel
  - require watch systems are so arranged that the efficiency of all watchkeeping personnel is not impaired by fatigue
  - the duties are organized so the first watch at the commencement of each voyage and subsequent relieving watches are sufficiently rested and otherwise fit for duty
  - Administrations shall require watch schedules to be posted where easily accessible

Section A-VIII/1: Standards for Watchkeeping

Revised *STCW Convention*

Fitness for duty

- All persons assigned as duty officer in charge of watch or as a rating forming part of a watch shall be provided a minimum of 10 hours rest in any 24-hour period.
- Hours of rest may be divided into no more than two periods, one of which shall be in at least 6 hours in length.
- Minimum period of 10 hours may be reduced to not less than 6 consecutive hours provided that any such reduction shall not extend beyond two days and not less than 70 hours of rest are provided each seven-day period.
- Rest periods need not be maintained in emergency or drill or in other 'overriding operational conditions'.

Section B-VIII/1: Guidance on the prevention of fatigue

Revised *STCW Convention*

- 'Overriding operational conditions' should be considered to mean only essential shipboard work which cannot be delayed for safety or environmental reasons or could not be reasonably have been anticipated at the commencement of the voyage.
- No universally accepted technical definition of fatigue, but owners/operators should be alert to factors which can contribute to fatigue:
  - excessive or unreasonable overall working hours
  - frequency and length of leave periods
  - poor quality of rest
  - noise
- Administration recommended to consider introduction of a requirement that records hours of rest.

Regulation VIII/2: Watchkeeping arrangements

Revised *STCW Convention*

- The Master shall ensure that watchkeeping arrangements are adequate for maintaining a safe watch and that:
  - officers in charge of the navigational watch navigate safely when they shall be physically present on the navigation bridge
  - radio operators are responsible for maintaining a continuous radio watch on appropriate frequencies during periods of duty
  - officers in charge of an engineering watch shall immediately be available on call to attend machinery spaces and when required, be physically present in the machinery space during their periods of responsibility
  - an appropriate and effective watch or watches are maintained for the purpose of safety at all times while at anchor, moored, and while carrying hazardous cargoes

ABS Integrated Services Inc. Chart 64

Marine Services Division

Section A-VIII/2: Standards for Watchkeeping

Revised *STCW Convention*

Principles to be observed in keeping a navigational watch

- Watch arrangements
- Look-out
- Taking over the watch
- Performing the navigational watch
- Watchkeeping under different conditions and in different areas
  - **clear weather**
  - **restricted visibility**
  - **hours of darkness**
  - **coastal and congested waters**
  - **navigation and pilot on board**
  - **ship at anchor**

ABS Integrated Services Inc. Chart 65

Marine Services Division

Section A-VIII/2: Standards for Watchkeeping (cont.)

Revised *STCW Convention*

Principles to be observed in keeping an engineering watch

- Watch arrangements
- Taking over the watch
- Performing the engineering watch
- Watchkeeping under different conditions and in different areas
  - restricted visibility
  - coastal and congested waters
  - ship at anchor

ABS Integrated Services Inc. Chart 66

Marine Services Division

Section A-VIII/2: Standards for Watchkeeping (cont.)

Revised *STCW Convention*

Principles to be observed in keeping a radio watch

- Companies to ensure watchkeeping personnel comply with the following provisions to ensure that an adequate safety radio watch is maintained while the ship is at sea.
  - watch arrangements maintained in accordance with radio regulations and SOLAS
  - performing the radio watch on specified frequencies

Section A-VIII/2: Standards for Watchkeeping (cont.)

Revised *STCW Convention*

Principles which apply to watchkeeping in port:

- Watch arrangements
- Taking over the watch
- Taking over the deck watch
- Taking over the engineering watch
- Performing the deck watch
- Watch in port on ships carrying hazardous cargoes
- Performing the engineering watch

Training and Certification: Actions to be taken by Administrations prior to 1 February 1997

Revised *STCW Convention*

- All training and assessment of seafarers is administered, supervised and monitored as required by section A-I/6
  - All persons who provide any training, assessment of competency or evaluate any demonstration of continued proficiency are to be appropriately qualified
- Quality standards system is in place and covers training and assessment and certification activities of all maritime training academies, onboard training and assessment of activities and all governmental activities concerning training and certification
- Medical standards established and applied to all candidates for certificates other than those covered by transitional provisions of Reg. I/15
- Register to permit timely verification of authenticity and validity of certificates, endorsements and dispensations

Training and Certification: Actions to be taken by Administrations prior to 1 February 1997 (cont.)

Revised *STCW Convention*

- Mandatory simulator-based training taking account of performance standards for simulators brought into use on or after 1 February 2002
- Legal requirements and administrative provisions to ensure company compliance with regulation I/14
- All persons employed or engaged have received approved familiarization training or instruction
- Seafarers with designated safety or pollution prevention duties required to provide evidence of having retained prescribed standard of competence
- Seafarers with designated fire-fighting operations holds certificates requiring achievement or retention of prescribed standard of competence in advanced fire-fighting

ABS Integrated Services Inc.

Chart 70

Marine Services Division

Training and Certification: Actions to be taken by Administrations prior to 1 February 1997 (cont.)

Revised *STCW Convention*

- Seafarers designated to provide medical first aid are to have certificates of competence
- Seafarers designated to take charge of medical care are to have certificates of competence
- Masters, officers, ratings and other personnel on ro-ro passenger ships hold documentary evidence of required training (except for regulation V/2, paragraph 5 which is extended to 1 August 1998)
- At the discretion of the Party, existing GRT limitations of certificates and endorsements replaced by new values
- National legislation, processes and procedures in place for investigations and ensure enforcement of appropriate penalties and disciplinary measures for non-conformance with the Convention

ABS Integrated Services Inc.

Chart 71

Marine Services Division

Training and Certification: Actions to be taken by Administrations prior to 1 February 2002

Revised *STCW Convention*

- All transitional provisions of regulation I/15, other than GRT limitations are phased out by 1 February 2002
  - Action taken to be reflected in report on next subsequent independent evaluation of the quality standards system to IMO
  - Reports to be provided at intervals not exceeding 5 years
  - If maximum permitted interval is adhered to, phase out would be reported no later than 1 August 2003

ABS Integrated Services Inc.

Chart 72

Marine Services Division

Training and Certification: Actions to be taken by Administrations prior to 1 February 2002 (cont.)

Revised *STCW Convention*

Alternative certification

- Party may issue or recognize alternative certificates for use in its own ships
  - Party must communicate that choice to IMO before issuing any such certificates
  - Relevant legal and administrative measures, policies, training, examinations and assessment of competence to be provided on their application of alternative certificates
  - specimen copies of the types of safe manning documents are to be provided

Marine Services Division

ABS Integrated Services Inc.

Chart 73

Flag State Responsibilities: Actions to be taken by Administrations prior to 1 February 1997

Revised *STCW Convention*

- Legislation, regulations and administrative instructions and procedures have to be in place:
  - require officers on seagoing ships to hold appropriate certificates and other personnel to be duly certificated or hold documentary evidence
  - prohibit performance of duties by non-qualified persons and functions required by duly qualified person or duly certificated person
  - require companies to comply with regulation I/14 in assigning seafarers, maintaining documentation and data on seafarers employed and on their familiarization with their duties
  - personnel on tankers are to have completed special training
  - personnel on ro-ro passenger ships engaged on international voyages to have completed special training
  - all persons other than passengers to have received familiarization training

Marine Services Division

ABS Integrated Services Inc.

Chart 74

Flag State Responsibilities: Actions to be taken by Administrations prior to 1 February 1997(cont.)

Revised *STCW Convention*

- Legislation, regulations and administrative instructions and procedures have to be in place:
  - all seafarers with designated safety or pollution-prevention duties are to receive familiarization training and basic safety training
  - those designated to control fire-fighting operations, to provide medical first aid or take charge of medical care are to be trained and certificated
  - establish and enforce rest periods for watchkeeping personnel
  - oblige companies, masters and watchkeeping personnel to observe revised watchkeeping provisions
  - investigate reported infractions of the Convention and enforce appropriate sanctions or disciplinary measures on ships flying its flag or by seafarers who hold certificates, endorsement or documentary evidence of dispensation

Marine Services Division

ABS Integrated Services Inc.

Chart 75

Flag State Responsibilities: Actions to be taken by Administrations prior to 1 February 1997(cont.)

Revised *STCW Convention*

- Any certificates issued by other Parties for recognition by another flag State after 1 February 2002 should confirm such recognition to those Parties as soon as possible
- A seafarer found competent by one Party does not relieve the Administration of responsibility to ensure the seafarers manning its ships are properly trained and qualified
- Administrations are to make appropriate arrangements for the instruction of masters and senior officers in its maritime legislation relevant to the functions they are to perform
- Administrations are to ensure changes in international and national regulations concerning safety at sea and protection of the marine environment are made available to ships flying its flag
- Issue of endorsements cannot be delegated by the Administration

ABS Integrated Services Inc.

Chart 76

Marine Services Division

Flag State Responsibilities: Actions to be taken by Administrations prior to 1 February 1997(cont.)

Revised *STCW Convention*

- Administrations may wish to encourage early application for endorsement for seafarers regularly serving on its ships whose certificates are to be recognized on or before 1 February 2002
- Photocopies of certificates and endorsements should not be accepted
- Administrations should check the authenticity and status with the authority issuing certificates before endorsement
- Date of expiry of the Administration's endorsement should not extend beyond the date of expiry of the certificate or endorsement
- When application made for revalidation, status of certificate is to be checked to confirm that the certificate has not been withdrawn, suspended or canceled
- Administrations (flag States) may issue certificates to seafarers holding certificates by other Parties rather than issue endorsements attesting to their recognition

ABS Integrated Services Inc.

Chart 77

Marine Services Division

Flag State Responsibilities: Actions to be taken by Administrations prior to 1 February 2002

Revised *STCW Convention*

- On 1 February 2002, transitional provisions regarding recognition and revalidation of certificates terminate-- Legislation, regulations and administrative instructions and procedures must be in place
- All officers as of that date, serving on ships of that flag State, are to hold appropriate valid or endorsed certificates issued by the flag State
- Seafarers may be allowed to serve, for up to three months, without holding the Administration's endorsement provided documentary proof is readily available on board that application for endorsement has been submitted to the Administration
- Authority to serve without endorsement is vested in the Administration to determine circumstances, procedures and instructions to be provided to consuls, diplomatic representatives and others concerned
- A list of the certificate which may ~~be considered for recognition~~ should be presented for the above mentioned cas

ABS Integrated Services Inc.

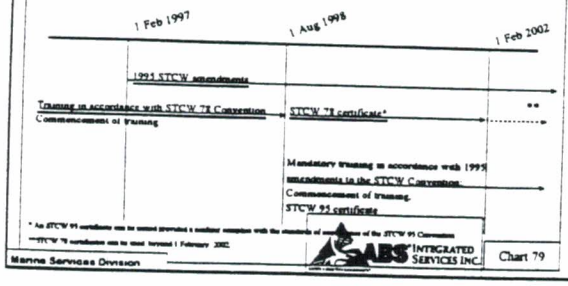
Chart 78

Marine Services Division

Transitional provisions

Revised *STCW Convention*

A diagram to reflect the application of transitional provisions for issue, recognition and endorsement of certificates (regulation I/15, paragraph 1)



USCG ACTIVITIES

- Interim rule published 6/27/97, effective from 7/28/1997
- Two definitions of interest:

  (1) Designated Examiner - trained or instructed in techniques of training or assessment and qualified to evaluate candidate for license - faculty member at Maritime Academy would qualify

USCG ACTIVITIES (Cont.)

(2) Qualified Instructor - person trained or instructed in instructional techniques and qualified to provide required training to candidates for licenses, documents, and endorsements - faculty member at Maritime Academy is qualified

USCG ACTIVITIES (Cont.)

- Instructors to have documentary evidence for conducting training:
  >experience, training or been instructed in effective instructional techniques;
  >qualified in the task for which training being conducted; and
  >hold the level of license, endorsement or other professional credential required of those who would apply

Chart 82

Marine Services Division

USCG ACTIVITIES (Cont.)

- Port State Control - NVIC 3/98, foreign ship examinations to include:
  >comparison of crew certificates and endorsements with Safe Manning Document
  >check posted watch arrangements for appropriate rest periods
  >examine new crew familiarization procedures

Chart 83

Marine Services Division

USCG ACTIVITIES (Cont.)

- PSC examination expanded if clear grounds that watch-keeping standards not maintained:

  >involvement in collision, grounding, or stranding
  >discharge of illegal substances
  >ship maneuvered in erratic or unsafe manner
  >operated in manner to pose danger to persons, property or the environment

Chart 84

Marine Services Division

USCG ACTIVITIES (Cont.)

- Training record books - NVIC 5-97
- Provides guidance on use of USCG accepted training record for approved program of training for candidates as deck or engineer officers

  >follows the STCW functions for the operational level tasks and provides criteria for recording satisfactory performance

USCG ACTIVITIES (Cont.)

- Training record book details practical training which should be completed prior to certification as OIC Navigation or E/R watch
- Onboard training program must be approved by the USCG or accepted by QSS organization
- USCG training record book implies need to identify shipboard and company training officers

Requirements for Masters, officers and ratings forming part of a navigational watch

Revised
STCW Convention

	Age	Approved minimum seagoing service	Supervised bridge watchkeeping duties	Radio requirement	Specialized training
Officer in charge of a navigational watch (>500 gt)	18	1 yr/3 yrs. *	6 months	Yes	As appropriate
Chief mate (>3000 gt)		1 yr			As appropriate
Master (>3000 gt)		36 months/ 24 months**			As appropriate
Chief mate (500-3000 gt)	18	1 yr/3 yrs. *	6 months	Yes	As appropriate
Master (500-3000 gt)		36 months/ 24 months**			As appropriate
Ratings	16	6 months		No	As appropriate

* Approved seagoing service in deck department/ non-approved training

** Must have approved seagoing service of not less than 36 months in that capacity but may be reduced to not less than 24 monthss if not less than 12 months have been served as chief mate

Requirements for officers and ratings forming part of an engineering watch

Revised
STCW Convention

	Age	Approved seagoing service	Approved education and training
Officer in charge of engineering watch (>750 kW)	18	6 months*	30 months
Chief engineer (>3000 kW)		36 months of which 12 months must be qualified as 2nd engineer	
Second engineer (>3000 kW)		12 months of approved service	
Chief engineer (750-3000 kW)		24 months of which 12 months must be qualified as 2nd engineer	
Second engineer (750-3000 kW)		12 months of approved service	
Ratings (<750 kW)	16	6 months approved under supervision of qualified engineering officer	As required under supervision of qualified

*** Seagoing service does not have to be part of an approved program**

APPENDIX 13

Integrated
Services, Inc.
An Affiliate of the American Bureau of Shipping
Marine Services Division

ABS Marine Services presents

the ISM Code
to

Research Vessel Operator Committee

5 November 1998

ABS Marine Services presents

the ISM Code
to

Research Vessel Operator
Committee

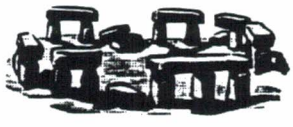
5 November 1998

1

INSANITY

Doing the same thing the same way
over and over again,
and expecting different results.

2



WHAT IS THE ISM CODE?

3

International Management Code for the Safe Operation of Ships and for Pollution Prevention

International Safety Management Code
(ISM CODE)

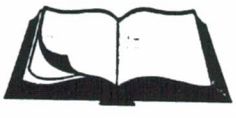
19 October 1989

IMO adopted Resolution A.647(16) entitled

"Guidelines on Management for the Safe Operation of Ships and for Pollution Prevention".

6 November 1991

Resolution A.647(16) was superseded by the adoption of A.680(17) although the title remained the same.



4 November 1993

IMO adopted Resolution A.690(17) as Resolution A.741(18) and titled it:

"The International Management Code for the Safe Operation of Ships and for Pollution Prevention",

also known as the

"International Safety Management (ISM) Code"

7

27 May 1994

Resolution A.741(18) was adopted at the IMO MSC 63 and 1994 SOLAS Conference.

A new chapter in SOLAS, Chapter IX, has been developed to implement the ISM Code.

8

Scope & Application of the ISM Code

- By 1 July 1998:
  - Passenger ships, including high speed craft,
  - oil tankers, chemical tankers, gas carriers, bulk
  - carriers and cargo high speed craft of 500 gross
  - tonnage and upwards
- Passenger ships-no tonnage stipulation

9

Scope & Application of the ISM Code

- By 1 July 2002:
  - Other cargo ships and self-propelled mobile offshore drilling units (MODUS) of 500 gross tonnage and upwards

  - Not applicable to government-operated ships used for non-commercial purposes

ISM CODE DOES NOT

- Define safety levels
- Establish performance criteria
- Require that you exceed the quality performance of your competition

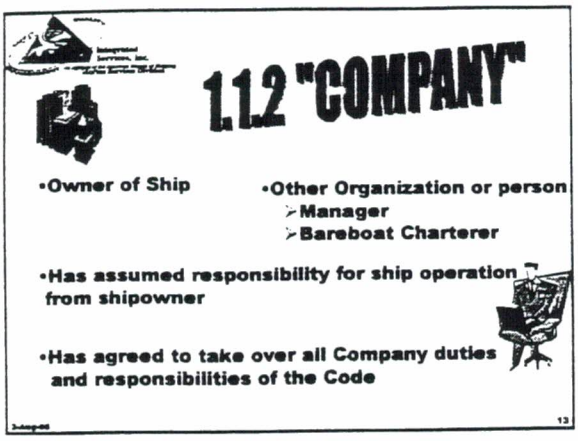
- Dictate how you will run your business - Just certain aspects of your safety system
- Guarantee that you will have no safety incidents

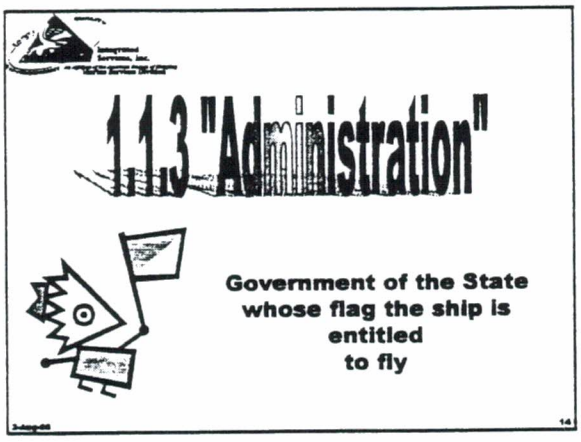
1.1.1 "International Safety Management (ISM) Code"

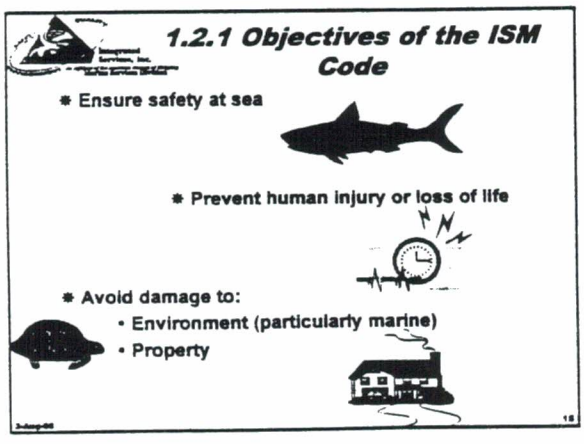
Official Title:

"The International Management Code for the Safe Operation of Ships and for Pollution Prevention"

(TIMCFRSOOSAFPP)


1.1.2 "COMPANY"
•Owner of Ship
•Other Organization or person
➢Manager
➢Bareboat Charterer
•Has assumed responsibility for ship operation from shipowner
•Has agreed to take over all Company duties and responsibilities of the Code
13


1.1.3 "Administration"
Government of the State whose flag the ship is entitled to fly
14


1.2.1 Objectives of the ISM Code
* Ensure safety at sea
* Prevent human injury or loss of life
* Avoid damage to:
• Environment (particularly marine)
• Property
18

1.2.2 Objectives of the Company

± Provide for safe ship operation practices

± Provide a safe working environment

± Establish safeguards against all identified risks

1.2.3 Objectives of the Safety Management System

➢ Compliance with mandatory rules and regulations

➢ Consideration of all applicable codes, guidelines and standards recommended by IMO, Administrations, classification societies & maritime industry organizations

1.3

Application

Code requirements may be applied to all ships

1.4 Functional Requirements

Safety Management System (SMS)

- Safety & Environmental protection policy
- Defined levels of authority
- Defined lines of communication between & among shore & shipboard personnel

19

1.4 SMS Functional Requirements

Procedures for....

- Safe ship operations
- Environmental protection
- Accident reporting
- Nonconformity reporting
- Emergency situation preparation & response
- Internal audit & management review

20

2

Safety and Environmental Protection Policy

Responsibility for and commitment to safety and environmental policy rests with highest levels of management

Policy is Company's top management statement of their values and beliefs on safety and environmental protection

21

2.2

SAFETY AND ENVIRONMENTAL PROTECTION POLICY

- Company must ensure policy is implemented & maintained
- At all organization levels
- Both on ship & ashore

3.1

Company Responsibilities and Authority

- If vessel "owner" is not entity responsible for operational management decisions, "owner" must report details of relationship with operator to Administration
- Organization responsible for management of ship should have a copy of this notification
- Must also be able to verify to an auditor that "owner" has met this requirement

3.3 Company Responsibilities and Authority

Resources

- **Equipment**
- **People**
  - **Trained auditors**
  - **Experience in ship types**
- **Technical resources**
- **Time**
- **Money**

4 Designated Person (S)

Point of contact for vessel ashore (Link)

May be one or more persons

Has direct access to highest level of management

NOT directly responsible for SMS implementation

16

5.1 Master's Responsibility & Authority

- Implementing Company policy
- Motivating crew to observe policy
- Issuing orders and instructions clearly & simply
- Verifying observance of specified requirements
- Reviewing the SMS
- Reporting SMS deficiencies to shore based management

26

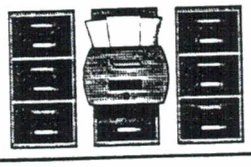
5.2 Master's Responsibility & Authority

- Shipboard SMS clearly states Master's overriding authority & responsibility
- Makes decisions about safety & pollution prevention
- Requests company assistance as may be necessary
- Has authority to act "in extremis"

27

6.1 Resources & Personnel

- Master is "Properly" qualified for command (qualification criteria set)
- Master is fully conversant with SMS (before assuming command)
- Master is given necessary support so that duties can be safely performed



6.2 Resources & Personnel

- ✓ Company ensures that each ship is properly manned
- ✓ Seafarers are qualified, certificated and medically fit
- ✓ Seafarers meet national & international requirements

6.3 Resources & Personnel

- Instructions when boarding
- Fire & Boat Stations - forecastle card
- SOLAS Training Manual & reference material
- Job overlap - turnover

6.4 Resources & Personnel

All people involved in the SMS have an adequate understanding of relevant rules, regulation, codes and guidelines

6.5 Resources & Personnel

- × Procedures identify training which may be required to support the SMS
- × Such training is provided for all people concerned
- × Training needs based on function & performance requirements of position

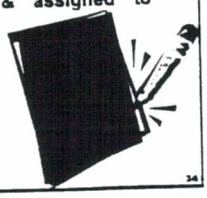
6.6 - 6.7 Resources & Personnel

- Company procedures require that crew members receive information on the SMS in a language they understand

- All crew members are able to communicate effectively to execute their SMS related duties

7 Development of Plans for Shipboard Operations

- Establish procedures for plan & instruction preparation
- Cover key shipboard operations concerning ship safety & pollution prevention
- Tasks involved are defined & assigned to qualified personnel



7 Development of Plans for Shipboard Operations

- Operations conducted under controlled conditions
- Documented procedures or instructions where absence would adversely affect operations
- Procedures suitable for lowest skill level in function
- Augment frequently by training

8.1

Emergency Preparedness

Emergency Preparedness

- Procedures define how both ship & Company identify, describe & respond to potential shipboard emergencies
- Emergency response plans
- Firefighting/lifesaving
- OPA 90 vessel response plans (SOPEPs)
- Fault tree analysis
- Salvage plans

8.2 Emergency Preparedness

- Program for drill & exercises to prepare for emergency actions
- Both ship and shore-based
- Fire & boat drills
- Proper use of emergency equipment
- Emergency generator operation
- Loss of steering

8.3 Emergency Preparedness

- Company can respond at any time to hazards, accidents & emergency situations involving its ships
- Fire fighting equipment inspections
- Vessel safety equipment inspections
- Oil spill response plans & equipment
- Readiness of shore-based resources

9.1 Reports and Analysis of Nonconformities, Accidents and Hazardous Occurrences

- **Goal - report & reduce/eliminate nonconformities, accidents and hazardous situations**
- **Records of nonconformity disposition kept**
- **System set up to notify appropriate people both ashore and on vessel**

9.3 Disposition of Nonconformities

- Disposition is action taken to immediately control or minimize effect of nonconformity
- Must be approved by authorized people
- Notify other people affected by disposition decision
- DO NOT confuse with corrective action (9.2)

9.1 Examples of Nonconformities

Near misses

Accidents

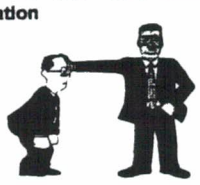
Hazardous situations

Insurance Claims

Failure of the management system to fulfill a specified requirement

9.2 Corrective Action

- Corrective action begins with detection of a nonconformity, accident or hazardous situation, or related trends
- Investigate circumstances to find root cause of nonconformity or other situation
- Record investigation



9.2 Corrective Action

? *Determine corrective action needed to eliminate root cause of nonconformity*

? *Corrective action should result in a documented system change to prevent recurrence*

? *Implement the change*

? *Verify effectiveness of system change in nonconformity elimination*

43

10.1/10.2 Maintenance of the Ship & Equipment

- **Establish maintenance procedures**
- **Ensure ship is maintained according to relevant rules, regulations and Company requirements**
- **Do inspections at appropriate intervals**
- **Report any nonconformity found with its possible cause, if known**
- **Take appropriate corrective action**
- **Keep maintenance records**

44

10.3 Maintenance of the Ship and Equipment

- Identify equipment and technical systems which may result in hazardous situations if they fail suddenly during operation
- Act to promote reliability of such equipment and systems
- Do regular testing of stand-by arrangements and equipment or technical systems not in continuous use

46

10.4 Maintenance of the Ship and Equipment

- Integrate inspections required by 10.2 and 10.3 into ship's operational maintenance (i.e., P/M) routine.
- Calibrate equipment used for maintenance inspection, measuring & test against known traceable standards

11.1

Documentation

- Identify all controlled documents relating to requirements of Code
- Maintain master list with number, title, date and latest revision
- Document methods for change control and approval
- Method & degree of control should be appropriate to type of document

11.2 Documentation

- Valid documents are available at all relevant locations
- Changes to documents are reviewed and approved by authorized personnel
- Obsolete documents are promptly removed

11.3 Documentation

- Documents used to describe and implement the SMS called "Safety Management Manual"
- Keep documentation in a form that Company considers most effective
- Each ship carries on board all documentation relevant to that ship

12.1 Company Verification, Review and Evaluation

Perform internal safety audits to verify if safety and pollution prevention activities comply with the SMS

Base scope and frequency of internal SMS audits on status and importance of activity being audited relative to safety and environmental protection

Audit the SYSTEM for safety management

12.2 Company Verification, Review and Evaluation

Procedure for management reviews

Periodic (e.g., annual) management reviews ensure that SMS continues to satisfy Code, & support management policy & objectives

Include audit results, corrective actions, nonconformities & trends as part of management reviews of SMS

12.3/12.6 Company Verification, Review & Evaluation

- Manage internal audits and corrective action with written procedures
- Independent internal auditors (where practicable)
- Report audit and review results to those responsible
- Timely corrective action by responsible management

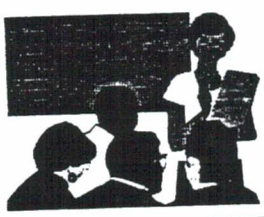
(12)

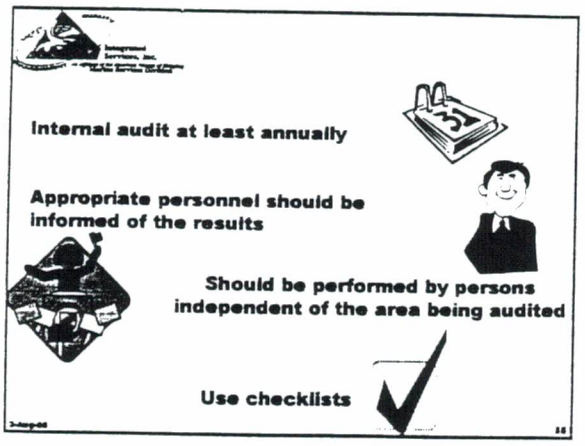
INTERNAL AUDITS

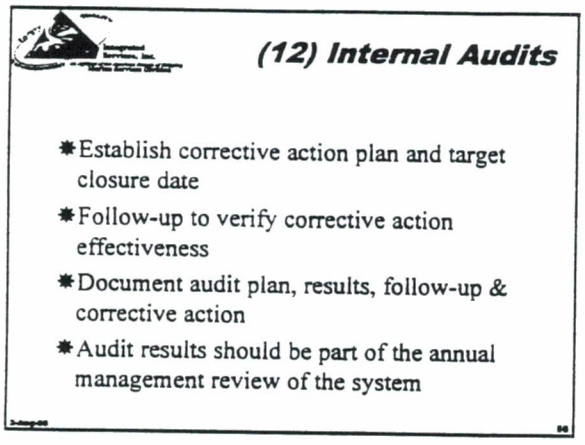
INTERNAL SMS AUDITS

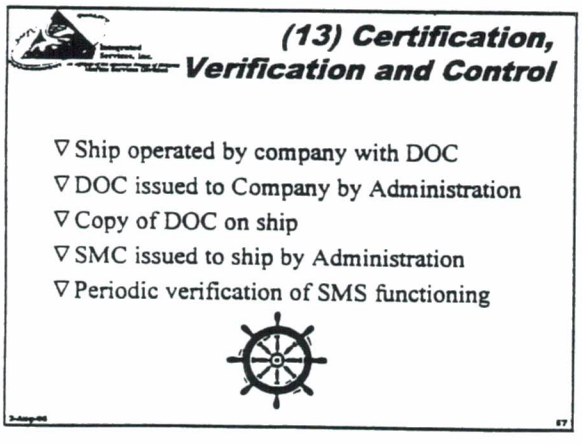
Internal audit system procedures for:

- Planning and scheduling
- Performance
- Reporting
- Follow-up
- Records

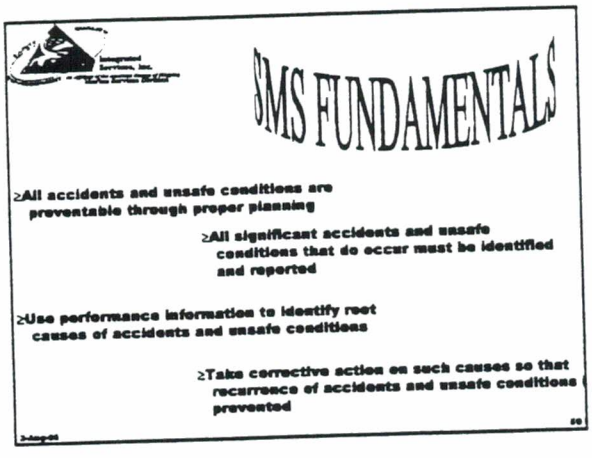


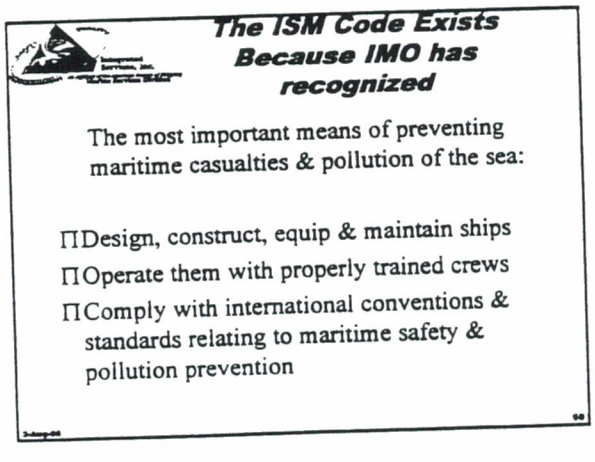

Internal audit at least annually
Appropriate personnel should be informed of the results
Should be performed by persons independent of the area being audited
Use checklists

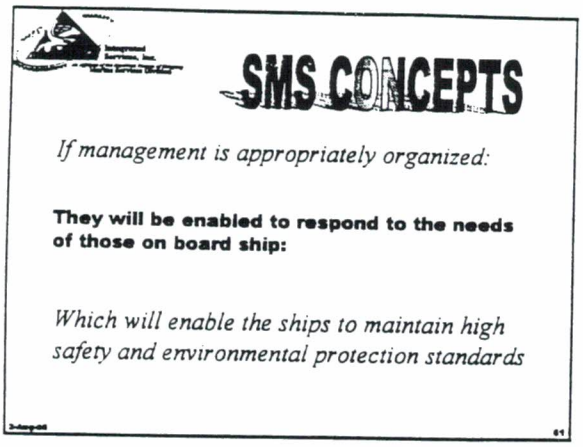

(12) Internal Audits
Establish corrective action plan and target closure date
Follow-up to verify corrective action effectiveness
Document audit plan, results, follow-up & corrective action
Audit results should be part of the annual management review of the system

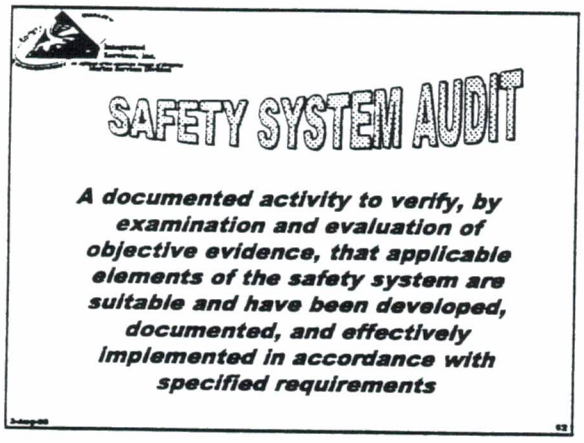

(13) Certification, Verification and Control
Ship operated by company with DOC
DOC issued to Company by Administration
Copy of DOC on ship
SMC issued to ship by Administration
Periodic verification of SMS functioning

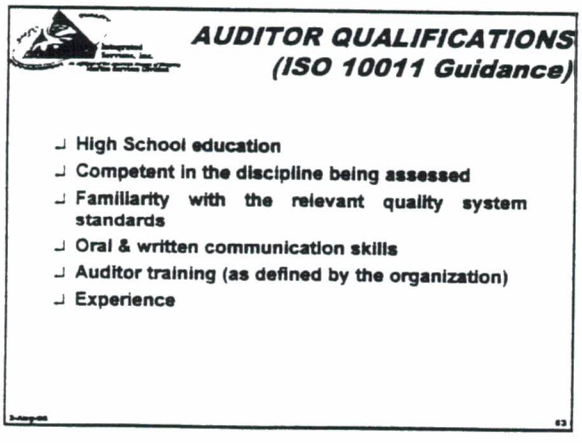

SAFETY PERFORMANCE
CAN
BE IMPROVED


SMS FUNDAMENTALS
≥All accidents and unsafe conditions are preventable through proper planning
≥All significant accidents and unsafe conditions that do occur must be identified and reported
≥Use performance information to identify root causes of accidents and unsafe conditions
≥Take corrective action on such causes so that recurrence of accidents and unsafe conditions prevented


The ISM Code Exists Because IMO has recognized
The most important means of preventing maritime casualties & pollution of the sea:
Design, construct, equip & maintain ships
Operate them with properly trained crews
Comply with international conventions & standards relating to maritime safety & pollution prevention


SMS CONCEPTS
If management is appropriately organized:
They will be enabled to respond to the needs of those on board ship:
Which will enable the ships to maintain high safety and environmental protection standards


SAFETY SYSTEM AUDIT
A documented activity to verify, by examination and evaluation of objective evidence, that applicable elements of the safety system are suitable and have been developed, documented, and effectively implemented in accordance with specified requirements


AUDITOR QUALIFICATIONS
(ISO 10011 Guidance)
High School education
Competent in the discipline being assessed
Familiarity with the relevant quality system standards
Oral & written communication skills
Auditor training (as defined by the organization)
Experience

NONCONFORMITY STATEMENTS

Cite Specific Requirement

Substantiate With Objective Evidence

Cite Specific Nonconformance (Nature)

Major Or Minor?

Observations

Concise - But Complete

Corrective Action & Follow-up

- **C/A is the Responsibility of the Auditee-Not Auditor**
- **Develop Corrective Action Plan -**
  - **Identify Root Cause And**
  - **Action Taken to Eliminate Root Cause**
- **Establish Implementation Period**
  Document Actions Taken
- **Provide Response to Lead Auditor**
- **Follow-up/verification Audit (if required)**
- **Closure of Nonconformances**
- **Follow-up Report**

ISM CERTIFICATION

ISM CERTIFICATION

- Terms used to describe ship types in U.S. law and regulations differ with SOLAS
- Difference applies only to terminology use; does not affect the types of ships that must comply, e.g. freight vessel = cargo ship
- Compliance with SOLAS mandatory for ships engaged on international voyages
- Flag State has authority outside IMO

ISM CERTIFICATION (contd.)

- To obtain certification:
  - >develop and implement a Safety Management System (SMS)
  - >SMS is HOW Company management has decided to do WHAT their own policy about safety requires
  - >should be integrated into the daily operations of the organization

ISM CERTIFICATION (contd.)

- Objectives of safety and environmental management:
  - >safety of personnel;
  - >protection of the environment;
  - >prevention of pollution;
  - >prevention of damage to equipment;
  - >regulatory compliance;
  - >emergency preparedness;
  - >continual improvement of work practices

ISM CERTIFICATION (contd.)

- Four main elements of an SMS;
  - <establish commitment to take appropriate action;
  - >define purpose and establish plan;
  - >ensure capability to perform in support of objectives; and
  - >continually evaluate learn and improve

ISM CERTIFICATION (contd.)

- Process can take from 12-18 months;
  - >management commitment
  - >develop plan and schedule
  - > develop safety management manual
  - > project organization
  - >develop procedures
  - >train management and staff
  - >conduct internal audits
  - >institute corrective action
- Request system audit and certification

HOW TO OBTAIN CERTIFICATION?

- Certificates are issued by or on behalf of an organization
- ABS is a "recognized organization" by a number of flag states including USCG (49 as of 26 Feb 1998)
- ABS complies with IMO Resolution A739(18), (resources for technical, managerial and research capabilities, rules for design, construction and certification)

HOW TO OBTAIN CERTIFICATION (contd.)

- External audit necessary to determine that SMS is in compliance with the ISM Code, is effectively implemented and is in use by the Company's personnel, ashore and afloat
- Auditor looking for objective evidence to demonstrate that the Company's SMS has been functioning effectively ashore for at least three months, and an SMS has been in operation onboard at least one of each ship type for at least three months

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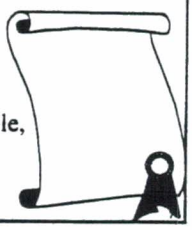
HOW TO OBTAIN CERTIFICATION (contd.)

- Objective evidence to include records from the internal annual audit performed by the Company, ashore and onboard
- When satisfied, auditor will recommend issuance of DOC certificate for Company
- Shipboard audit is then possible, and if in compliance, SMC certificate will be issued



CERTIFICATION

- Validity of DOC subject to annual verification within three months before or after anniversary date

  >confirm effective functioning of the SMS, including corrective actions and modifications to the SMS since previous verification

  >DOC renewed after five years

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CERTIFICATION (contd.)

- Validity of the SMC subject to at least one intermediate verification to confirm effective functioning of the SMS
  - >take place between between the second and third anniversary date of the issue of the SMC and renewed after 5 years
  - >verify corrective actions resulting from Company internal audits

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CERTIFICATION (contd.)

- Frequency of intermediate verification may be increased due to nature of non-conformities
  - >decision made by Administration

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CERTIFICATION DECISION

- ISM Code certification is not hardware related - it is a management system
- Focus on relationship between shoreside and shipboard personnel
- Management system which makes good business sense - core values safety and pollution prevention - demonstrate commitment to important values
- Provides means for encouraging continuous improvement of safety management skills

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CERTIFICATION DECISION (contd.)

- Expectation that Port State Control will recognize Company benefits from ISM and hence selection of ships for inspection
- If compliance voluntary outside ISM Code scope of ship types, then probably Port State Control less likely, but not a reason for Company not to ensure compliance with the SMS during the validity of certificates

CERTIFICATION DECISION (contd.)

- Need to recognize the international desire to fully enforce the provisions of SOLAS Chapter IX
- Port State Control likely to verify ISM Code compliance as part of general examination which may become expanded to include compliance with the requirements of the ISM Code if "clear grounds" are identified

APPENDIX 14

Ireland Consulting Services, Inc.
58 North Briar Drive
North Kingstown, Rhode Island 02852

Marine Operations and Safety

Captain George F. Ireland, USCG, Ret'd
(401) 885-2822
(401) 885-3678

Fax (401) 885-2822
(call first)

Facsimile Transmission

Date: 4 November 1998

Cover + 3 pages

Please pass this information to: **Mr. Paul Ljunggren**:

Paul,

Returned home later than expected. In any case, here is some regulatory info for your disposition. Trust it is helpful.

Hope you get to enjoy your time away from east coast.

Best regards.

George

Ireland Consulting Services, Inc.
58 North Briar Drive
North Kingstown, Rhode Island 02852

Marine Operations and Safety

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RVOC
Regulatory Highlights
11/98

I've been asked to provide you with current 'regulatory information'. Most of the items listed below are regulatory initiatives discussed previously that are not yet required to be fully implemented - but will be. I note that some of these items are on the schedule for discussion - good choices.

In addition, I've included a couple of items, such as licensing of mariners, that should be of general interest.

Feel free to call me if you have questions.

STCW

I reported on the STCW Convention a year ago. At that time the Coast Guard had published an interim final rule that implemented most of the technical terms of the convention and in the same rulemaking asked for comments from the public. A final rulemaking is still forthcoming.

Meanwhile, the Coast Guard has published several Navigation and Vessel Inspection Circulars to assist marine managers with implementation of STCW. These circulars are available via the internet from the CG web site. I've found them helpful - some contain summary check-off sheets that are particularly useful. If you are responsible for STCW implementation I encourage you to get this information.

A reminder regarding application. STCW applies to 'seagoing' ships regardless of size or tonnage. For U.S. implementation, 'seagoing' means seaward of the Boundary Line. Tonnage values determine application of certain STCW measures. 'Old' tonnage values, up to 1600 tons, may be used for vessels that trade exclusively to and from U.S. ports.

GMDSS

GMDSS (Global Maritime Distress and Safety System), brings satellite communications into the marine world in an internationally agreed upon way. Technical standards of GMDSS are now in Chapter IV of the SOLAS Convention. The FCC published final rules for GMDSS on 16 March 1992.

GMDSS applies to ships of 300 gross tons and over. Final implementation is required by 'cargo' ships (ships other than passenger ships) by 1 February 1999.

The STCW interim final rules address training requirements for certain persons assigned to GMDSS ships.

ISM

I also reported on implementation of the ISM Code a year ago. The Coast Guard published proposed rules in the Federal Register on 1 May 1997. Final rules, expected this year, have not yet been published.

The ISM Code now resides in Chapter 9 of the SOLAS Convention and applies to ships of 500 gross tons and over. Implementation is required for oceanographic ships (ships other than passenger vessels, oil tankers and bulk carriers) by 1 July 2002.

Licensing and Documentation

The Coast Guard on 21 September 1998 published a Notice in the Federal Register essentially stating the agency wishes to privatize certain portions of the licensing and seaman documentation function and solicited public comment. The period for public comments closed on 23 October 1998.

The notice contained 8 questions to which the CG solicited responses. The core of the notice, in my opinion, is that the CG wishes to privatize the *examination* system and wanted a public response. I expect we'll see several changes in these procedures.

I'm sure there will be more to follow.

Life Saving Rules

Regulations for lifesaving equipment were consolidated into single subchapter and rearranged to be more compatible with SOLAS standards. This process was completed on 1 October when final rules for lifesaving equipment were published in the Federal Register.

Impact on Oceanographic Research Vessels is stated as minimal. There may be some subtle changes, particularly for vessels on foreign voyages - requirements for SOLAS markings for example. I suggest marine managers for vessels that operate on foreign voyages review these rules.

Miscellaneous

I've commented previously that the *commercial towing* population of our industry has increasingly become subject to safety and pollution prevention measures enforced by the Coast Guard. This work by regulators follows similar measures implemented for the *commercial fishing* industry, and leaves the oceanographic research vessel fleet (those vessels less than 300 gross tons) as the last largely unregulated population of ocean-going vessels.

The most recent regulatory measures for towing vessels was published by the Coast Guard on 13 October 1998 and specifies additional standards for vessels that tow tank barges in the navigable waters of the First Coast Guard District (New England). This is the first time in my memory the Coast Guard has applied 'regional rules' for vessels in a specific trade and was brought about by the SCANDIA/NORTH CAPE grounding.

The lesson, in my opinion, is to take implementation of RVOC Safety Standards very seriously. If not, the opportunity will exist for others to set standards for the ocean-going research fleet.

APPENDIX 15

SCRIPPS INSTITUTION OF OCEANOGRAPHY

THE LAY-UP EXPERIMENT

ROGER REVELLE

Days in period		365
Operating days		0
Days at Sea		0
Ship Base Salaries	$	382,442
Fringe benefits	$	63,362
Total ship's payroll	$	445,804
Pers. cost/day		
Ship maintenance & Repairs	$	100,000
SHIPYARD RESERVE	$	-
Total M&R	$	100,000
M&R per day		
Other ship costs		
A. Fuel		
B. Food		
C. Insurance	$	33,750
D. Stores, S&E etc	$	25,000
E. Travel		
G. Misc & Services	$	50,000
Total 'Other'	$	108,750
Total ship costs	$	684,554
Total Distributed costs		135,000
Total Direct Costs	$	819,554
Indirect Costs	$	106,542
Total Operating Costs	$	**926,096**

Cost Per Day

note: Misc. includes regular ABS certs, fire systems certs, liferafts, training, medicals, communications, mobilization etc.

If a Drydocking period is concurrent with a Lay-up, the Dry docking will be scheduled during this period and MOSA funds will be used as appropriate and authorized.

R/V Roger Revelle

Position	Regular Crew	Casual/ Career	per mo 1999	1999	Ship Ops FTE
SR. CAPTAIN		career	4125	49500	0.50
CHIEF MATE		career	4597	55184	1.00
2ND MATE		career	0		
3RD MATE		casual	0		
BOATSWAIN		career	2667	32004	1.00
AB SEAMAN		casual	0		
AB SEAMAN		casual	0		
AB SEAMAN		career	2288	27456	1.00
AB SEAMAN		casual	0		
ORDINARY SEAMAN		casual	0		
SR. CHF. ENGINEER		career	3855	46254	0.50
1ST ASST. ENGINEER		career	4397	52764	1.00
2ND ASST ENGINEER		casual	0		
3RD ASST ENGINEER			0		
OILER		casual	0		
OILER		Career	2211	26532	1.00
OILER		casual	0		
OILER		career	2000	24000	1.00
WIPER		casual	0		
ENGINEER APPRENTICE			0		
ELECTRICIAN		career	4064	48768	1.00
SR. COOK		career	0		
COOK		career	0		
SR. ELECTRONICS TECH			0		
	TOTAL:		30204	362442	